CHEETAL

JOURNAL OF THE WILDLIFE PRESERVATION SOCIETY

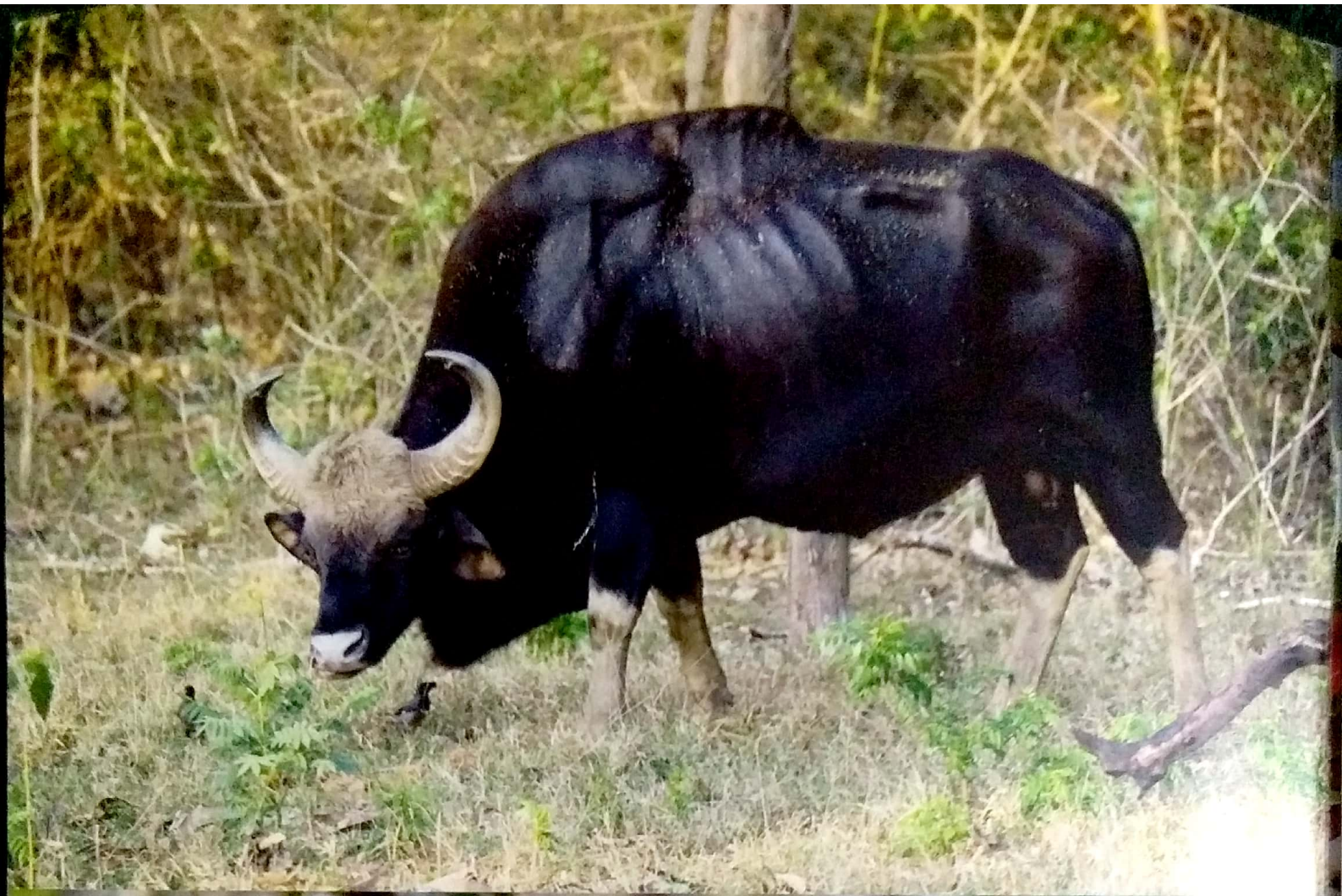
ESTD: 1958

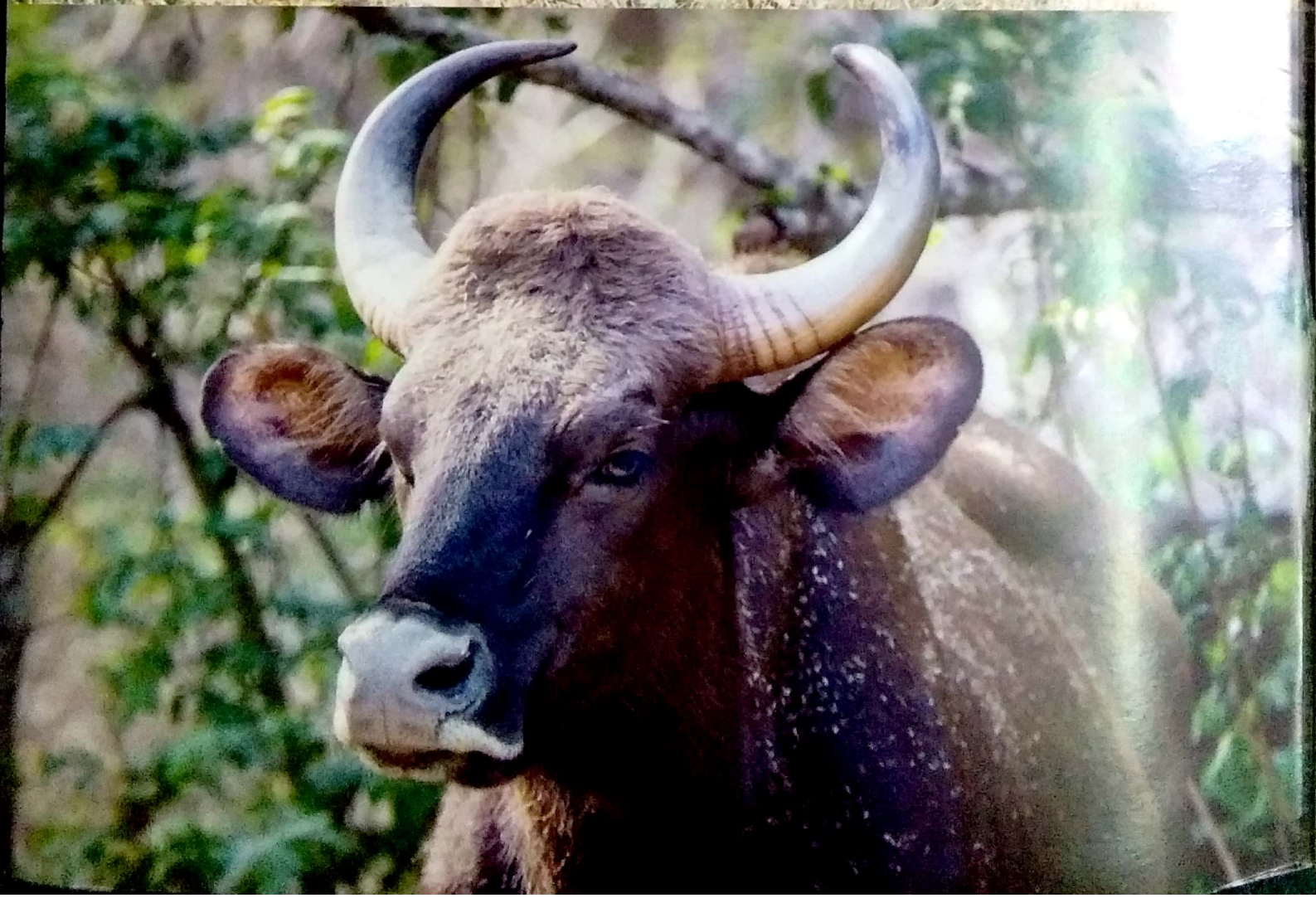
(JANUARY - APRIL 2018)

Website: www.wpsidun.org

Cheetal Vol 55 No 1 (2018) ISSN: 0528-9122

Scanned by CamScanner





Scanned by CamScanner

CONTENTS

(i)	*Cover Photos*		*2*
(ii)	*Editorial*		*3*
(iii)	*Cover Story*	*Mayank Sharma*	*4*
1.	***The Endangered Teesta Elephant-Corridor***	*Vinod Rishi*	*5*
2.	***Mission Black Panther***	*Adikarthik Shankar*	*10*
3.	***Neelgai and Wild Boar***	*Mathen 'Rajeev' Mathew*	*15*
4.	***Jackal Jottings: They Share Our Space Too***	*Malaika Mathew Chawla*	*24*
5.	***Tracking the Striped Cat***	*Sagarika Phalke*	*28*
6.	***Sighting Muntiacus muntjak (Zimmermann, 1780), The Barking Deer, at Sahastradhara (Dehra Dun, Uttarakhand), with Systematic Account, Distribution and Floral Cover***	*Akhlaq Husain & Abdur Rahman*	*32*
7.	***Bulbuls of the Doon Valley***	*Abhai Mishra*	*39*
8.	***Avian Friends***	*Dig Vijai Singh*	*41*
9.	***First case of Wolf attack on Human in Western Rajasthan, India.***	*Aazad Prakash Ojha & L.S. Rajpurohit*	*45*
10.	***Relative Condition Factor in Labeo bata (ham) from River Ghaghra***	*Alpana Parmar &P.K.Mathur*	*47*
11.	***Field observations on the early flowering of the Rhododendron (Rhododendron arboreum) in the Gadoli and Manda Khal fee simple estates : An indicator of climate change in the Garhwal Himalaya***	*Subir Mario Chowfin*	*53*
a	*The Wildlife Preservation Society*		*58*
b	*Membership Form*		*59*
c	*Methodology for Write Up & Submission of Papers*		*63*

COVER PHOTOS

Front Cover

1.	Black Panther (*Panthera pardus*)	Mayank Sharma

Front Cover (Inner)

1.	Gaur/Indian Bison (Male) (*Bos gaurus*)	Mayank Sharma
2.	Gaur/Indian Bison (Female) (*Bos gaurus*)	Mayank Sharma

Last Cover (Inner)

1.	Purple Sunbird (Male) (*Cinnyris asiaticus*)	Dr. Dushyant Singh Gaur
2.	Dalmatian Pelican (*Pelecanus crispus*)	Dr. Dushyant Singh Gaur

Last Cover (Outer)

1.	Royal Bengal Tiger (*Panthera tigris tigris*)	Adikarthik Shankar
2.	Asiatic lion (*Panthera leo persica*)	Adikarthik Shankar

Disclaimer

'Cheetal' - started in 1959, is the Official Journal published by Wildlife Preservation Society. The journal is intended as a medium for communication and discussion of important issues that concern wildlife and environmental activity.

All articles published in 'Cheetal', including editorials, articles, research papers, observations and commentaries, letters to editor and book reviews are deemed to reflect the individual views of authors and not the official points of view of editors and executive members of the society. All articles have been edited by the authors and the details in the 'About the author' section have been given by the authors.

Articles and Research Papers, once published in 'Cheetal' must not be published in other magazines and journals without permission of the Editor, in accordance with the Copyright Act.

The contributing authors are solely responsible for the accuracy of scientific contents particularly the scientific names of the species and statistical data mentioned in their articles. Authors are requested to send photographs related to the article and research papers (Example - If you are describing the findings related with fish or other animal, the photographs (colour) of that particular fish or animals. The location map or Special sight (Lake, River, Pond, Field etc.) must be given in the writeup.

EDITORIAL

Black is the absence of colour. The colour represents strength, power and authority. The black panther on the cover and the images of gaur, world's largest wild cattle, captured in the lens by Mr Mayank Sharma, personify the true majesty of the animals from the Indian jungles. We have previously published the cover in colour and the journal in black and white. This is the first all colour Cheetal which features the 'Black Beauties' on the cover and spectacular wildlife and nature photographs inside. The front and back cover feature the Big cats of India. We have also improved the paper quality. This transformation coincides with our society completing sixty years. The idea of an all colour Cheetal (amongst the oldest wildlife journals in India) was in our minds for a long time. Mr R D Singh Chandella, executive commitee member, further reinforced it and suggested positive changes in the journal. I hope our members will enjoy going through the new format.

Present issue of **Cheetal** includes articles from the states of West Bengal, Karnataka, Andra Pradesh, Goa, Maharastra, Rajasthan and Uttarakhand. This issue also features an article from Uganda written by our member Mr Digvijai Singh. We will publish another one from Africa by Mr Prakash Singh in the next issue.

Our member Mr Vinod Rishi IFS(R), has always been an inspiration and has contributed articles from his personal experiences which are of great academic value. His article on the elephant corridor is one such example. I thank Dr A J T Johnsingh for referring two young wildlifers, Ms Sagarika Phalke and Ms Malaika Mathew Chawla, requesting them to contribute articles for the journal. We look forward to Dr Johnsingh's support in the future as well .

The article by a budding nature lover, Mr Adikarthik Shankar, shows the passion and enthusiasm of the young man and his excellence in the field of wildlife photography. Mr Rajeev Mathew, a seasoned wildlifer, gives a different and interesting prospective regarding Neelgai and Wildboar.

After the introduction of Biodiversity Act 2002, Wildlife also falls under the umbrella of Biodiversity. The early flowering of Rhodendrone has been in news lately. The article by Mr Subir Mario Chowfin dwells in detail on the subject.

Past three issues we have been coming out with a format to be followed for scientific articles. I request authors to go through it and send their articles in the prescribed format. I also request photographers to send their photos in raw format without water marking.

Last but not the least, I thank our President Mr Rashmi Kant Shukla IFS(R), Executive Body and Members of the Editorial Board for all their support in coming out with this issue. A special thanks to Dr Dushyant Singh Gaur, MD and Mr Zaheer Bakshi for all the efforts put in to bring out this colourful issue .

Dr Prashant Singh
Executive Vice President

COVER STORY

Mayank Sharma

They say your lens can't capture what the eye can see. The lens captures how you feel when you see what you see. For what is art that doesn't make you feel!

When it's your first time in a safari, you hope that the forest will reveal itself for you. But, you keep your fingers crossed, you murmur silent prayers, because things are just not in your control.

Kabini, April 2016.

I had rented a 150-600 mm telephoto lens, which honestly is quite a handful if you're not used to it. My first morning safari was about to come to an end. There was no sign of the jungle cats. I had till now spotted deers and the mighty Indian Gaur and had made my peace with it. We were about to turn back, when things turned around.

We were told that a cat has been spotted in Zone A. Our driver rushed to the spot, adrenaline rushed through my veins. It wasn't just us, many had already reached. We all quietly, patiently waited there for about 20 minutes. The other jeeps left, but we and another jeep decided to wait. We must have waited for only 10 minutes more when we heard roars. Spine chilling, loud roars that made those seemingly long 10 minutes count.

It was two leopards battling it out behind the bushes. Moments later out came Blackie, the melanistic leopard of Kabini. This mighty, gorgeous, powerful cat started walking head on towards us.

I don't know if it was a battle won or lost but this gallant beauty had me transfixed. I remember it took me a minute before I could start clicking and then, the sound of the shutter never stopped. The shadow of the forest disappeared in the forest, leaving me with this surreal sense of achievement and a jaw aching smile.

Like I said, things are just not in your control in the forest.

About the Photographer :

Mayank Sharma is a photographer who captures stories in a frame. He is young and versatile. His body of work speaks volume about the way he thinks, and sees the world around him. His own story started in 2010 with the humble Canon Powershot A 620. An engineer by degree, photography was a passion.

This is how the journey has been so far:

Extensively documented the Indian music scene, 2010-2014. Some of his work includes the Korn India tour | Covering Raghu Dixit and his then band, Antaragni | Mahindra blues and Purvankara blues 2011-2012 | Children of Bodom, Oktoberfest 2012. He is one of the youngest music photographers as recognised by MTV Noise Factory (2011) and was duly featured in the Top 25 Indian music photographers - Polka café.

He has done theater portraits for Rajat Kapoor and Anupam Kher. From capturing the organised chaos backstage to the majestic performances on stage, his is an interesting take on theater and large scale TV productions.

He was one of the shortlisted contestants on National Geographic Cover Shot: Heritage City 2017

Wildlife happened in April 2016. Blackie, the black panther of Kabini was his first ever sighting, and the adrenaline sealed the deal for him. Forests visited so far are Nagarhole National Park(Kabini) | Corbett Tiger Reserve | Ranthambore Tiger Reserve | Bandipur Tiger Reserve | Mudumalai Tiger Reserve | Pench Tiger Reserve | Bandhavgarh Tiger Reserve | Kanha Tiger Reserve.

Commercially he has worked for Amazon, Leela Hotels, Loreal, Radisson Hotels, People Tree Hospitals (healthcare and technology), Vogue India, Varun Bahl.

He has been capturing the stories of Holi in Barsana and Nandgaon (two villages near Mathura) for two years consecutively. His work got featured in Vogue Italia 2014-2017.

Meet the man almost always behind the lens – **Mayank Sharma.**

THE ENDANGERED TEESTA ELEPHANT-CORRIDOR

Vinod Rishi
Chanderbani Grant, P.O. Mohabbewala, Dehradun - 248002
Email : vinodrishi@rediffmail.com

Once a very senior forest officer, experienced in the ways of wild animals and forests, told me, "You know, the best road builders in the Himalayas are the elephants in the foothills and pack-ponies in the higher reaches of the mountains! Most of the roads in the Duars were once elephant highways. The forest officers turned them into fair-weather forest roads." Duars is the name given to the well drained extensive apron of the Himalayan foothills east of Mechi river that draws the boundary between Nepal and India in northern West Bengal. Outside the forests the elephant highways have been converted into hard-topped roads.

The remnants of the original elephant highways can still be seen in parts in the Duars. Sections of these well beaten traditional elephant movement tracks, packed hard time and again under their heavy feet, still skirt the foot hills of the district of Darjeeling, and the districts of Assam and Arunanchal Pradesh, north of Brahmaputra River. In 1974, while working as Divisional Forest Officer, Baikunthpur Division, with my headquarters at Siliguri in the District of Darjeeling, I had mapped fragments of one such highway in the western Duars. It hugged the foot of Kurseong hills as it coursed through the Mahananda Wildlife Sanctuary and continued along eastward along a fire-line named the 9th Mile fire line till it descended into the bed of the river Teesta. In those days, the fireline marked the administrative boundary between Kurseong and Baikunthpur Forest Divisions. After descending into the Teesta River bed near Chumukdanga, a small village at the base of the western bank of the Teesta, the elephant movement path crossed a kilometer wide river bed and entered Gazalduba Reserved Forest in Apalchand Forest Range. Apalchand Range formed the eastern section of Baikunthpur Forest Division. From Gazalduba, the elephant highway continued through the forest till it emerged from the forest at the western bank of a small river named the Chel River, near a small town named Oodlabari. Beyond the Chel the traditional elephant path continued further on through tea gardens, cultivated countryside and small patches of forests in the District of Jalpaiguri. I had traced the elephant path from the western end of Mahananda Wildlife Sanctuary to the Chel River in the east. My jurisdiction ended at the Chel.

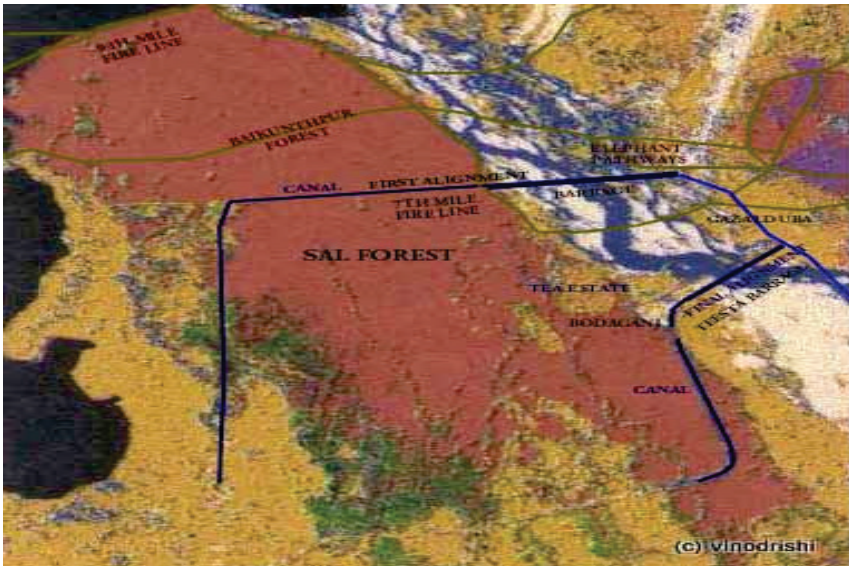
On a larger scale Dr. D.K. Lahiri Choudhury, an eminent authority on the Asian Elephant had mapped the elephant movement paths in the entire north Bengal. He called the paths that linked different fragments of forests as corridors. I had mapped the Teesta Corridor in 1974.

The Teesta Corridor was regularly used by the wild elephants, tigers, gaur and other animals occupying the forests of western Duars. But the corridor came to face the threat of its blockage by the construction of a barrage across the bed of the Teesta.

Before I proceed further, I think I should explain the terms like the 9th Mile fire-line, I am using in this write-up. Fire lines are wide strips inside the forest from which all trees are cleared up to thwart the advance of fire over the entire forest. Fire-lines parallel to one another, one mile apart, and aligned to run in the east-west as well as in the north-south direction form One-Mile-Square Grids. The sal forests in the Duars had such grids created during the old forestry days for better access and management of the forest. The one mile grids made it easy for the foresters to patrol and reach any point in the forest for its protection from fire and from timber thieves. The fire lines also provided openings and edges in the forest where deer and gaur grazed and elephants and tigers roamed.

Measuring distance from a major feature on the land the fire-lines aligned in the east-west direction were given numerical titles such as 1st Mile, 2nd Mile, 3rd Mile…etc., and those running in the north-south direction were given alphabetical identity: A, B, C…and so on. For instance, the 23rd Mile Fire-Line in Buxa tiger reserve on the main road from Alipurduar town to Jayanti Railway terminal was so named at it is 23 Miles from the nearest large town, Alipurduar. The 7th Mile Fire-Line in Baikunthpur Forest Division tells us that it is 7 miles away from Siliguri. The 9th Mile Fire Line was a major elephant movement route near Baikunthpur Division in 1970s, besides marking the boundary between Kurseong and Baikunthpur Forest Divisions.

The government had planned to build an irrigation and flood control barrage aligned across the river from Gazalduba Forest Beat Office to a fire line known as the 7th Mile Fireline, two miles south of the Chumukdanga village on the 9th Mile Fireline. The barrage plan included construction of an Inspection Bungalow on the western bank of the Teesta, for which forest land near the 7th Mile Fire Line was to be cleared. Forest land was also required to be cleared to let the western irrigation canal run along the 7th Mile fire line. After emerging from the forest it would meet the Siliguri-Assam national highway number NH31. The canal would then turn south and run past Siliguri to irrigate the crop lands in the distant plains of southern districts.



The matter came to my notice when the proposal for transfer of forest land to the Teesta Barrage Project Authorities was sent to me by the West Bengal Forest Directorate for my comments before the grant of permission to divert the forest land for development works could be considered.

I was familiar with my forest and could immediately notice the proposed alignments of the barrage and its canal were going to create many problems for forest and wildlife in the area. I noticed the canal would effectively divide the prime sal forest into two section. The barrage would straddle across the elephant highway across the Teesta and block their movement. It would force the elephants to seek out a new path to get to the other bank of the river, and in all likelihood make them walk into new villages and tea-labor lines, creating situations of violent confrontations between people and elephants. The impounded water upstream of the barrage would destroy with submergence an

extensive area of the wildlife rich river bed. It would also submerge the Chumukdanga village which would need additional forest area to be cleared up for the resettlement of the villagers.

Development needs sacrifices, but only if there is no other option available. I knew my areas and felt we could avoid the destruction of forest, and the ugly situation arising out of confrontation between people and elephants, and at the same time, we could also ensure the Teesta Barrage Project came up as per the schedule. It only needed better co-ordination between the forest and Teesta Barrage Project authorities.

The Project Engineers at Siliguri informed me that they had tried to minimize the damage to the forest by proposing the least destructive and shortest possible passage of the canal through the forest by aligning it along the 7th Mile fire line. It minimized the number of standing sal trees needed to be felled. Once outside the forest there was no need to fell trees standing by the side of the NH31. They had planned to build their colony for the barrage on the waste land on the eastern bank of the river outside the forest at Gazalduba forest, so that they averted the need to fell trees for constructing their colony.

I expressed my appreciation for their thoughtfulness and concern for forest. I invited the senior Engineers for a field visit to the sites they had planned for their Project. We visited various proposed sites, and I also took them to some other sites I felt they could examine as alternative alignments for the barrage and the canal.

I first drove them down the 7th Mile fire line through the forest in my jeep. From the high bank of the Teesta at the end of the fire line, we had a panoramic view of the kilometer-wide expanse of the river bed. We could also see the Gazalduba forest on the eastern bank of the river. The Engineers pointed out the proposed alignment for the barrage, the proposed site for their Inspection Bungalow and the canal they proposed to build. I discussed with them, showing the stretch of elephant highway that would be submerged by back water, the concerns I had.

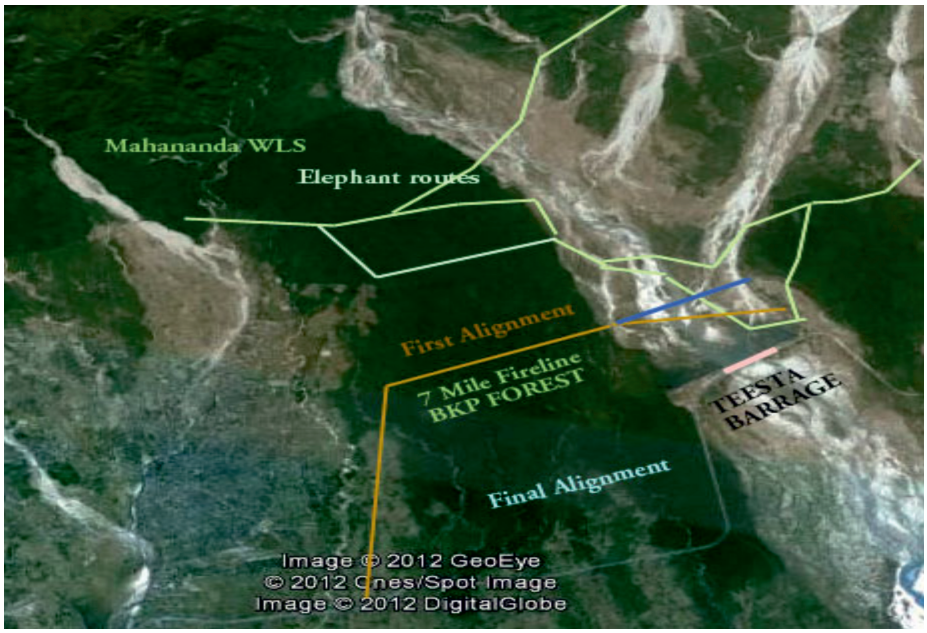
Next we drove south through the forest along a north-south fire-line, stopping at a few points on the Teesta Bank to see new sites I had in my mind. We passed through a tea garden and stopped at the high bank of the Teesta at Bodaganj. From here also Gazalduba on the eastern bank of the river was visible.

Then I explained to them in detail the problems we would be facing in the protection of the forest, people and wildlife, if the proposed alignment was accepted. The irrigation canal was as wide at its top as the fire-line. It was designed to be deep and had steep banks. It made the canal a barrier against the free movement of the forest patrol parties, not to speak of the free ranging of wild animals from one side of the forest to the other. It was also a death trap for any wild animal that might happen to fall into it because of its steep and slippery banks. Even if we plan for and provide some crossing points over the canal, they would be few and far between. In the patrolling, staff and the miscreants might find each other on the opposite side of the canal the nearest crossing point over the canal might not be near enough for the patrolling staff to chase and apprehend the miscreants without giving them enough time to escape. The advantage would go to the offenders who might enjoy watching the discomfiture of the forest patrols while they carried away their booty safely on the far side of the canal. Even more serious would be the loss of staff morale such failures would eventually usher in. It would not need many a failed attempt at capturing the poachers and other criminals to make the forest staff let the futility of their efforts overcome their zeal to apprehend the offenders. But the Project, too, was important for the overall good of the people.

I suggested the alignment I had in my mind for the barrage and the canal. We could visually see the new alignments I was suggesting. The realignment I had suggested for the barrage was a downstream shift of about a hundred yards at the Gazalduba end on the eastern bank of the river, and from 7th Mile Fireline downstream to where we stood near the village of Bodaganj on the western bank of the Teesta. The canal drawing water from the western end of the barrage would turn southward near Bodaganj, skirt the Belacoba forest and turn west to meet their proposed alignment of the canal to the south of Siliguri. I also showed them a good piece of land near the barrage for constucting their Inspection Bungalow.

On the way back we returned to Siliguri by a much shorter route through the forest. The new alignment shortened the total length of their canal, required less forest land for their entire Project, provided them a picturesque spot on the river bank for their Inspection Bungalow at, and gave them an easy access to Siliguri. It also saved the integrity of the Baikunthpur forest and the elephant corridor.

Fortunately, the Project Engineers found my suggestions acceptable.



The Teesta Barrage Project adopted the suggested alignment. The barrage and its infrastucture came up as suggested and the barrage was commissioned in 1986. The current alignment of the Barrage and its canals is exactly as we had jointly worked it out in 1974-75.

At the time of launching of Project Elephant in 1992-93, Teesta Corridor was still a threatened corridor. The barrage had created open and reclaimed fertile river bed suitable for cultivation, and like elsewhere all over India local farmers were quick to encroach upon such land. The corridor was once again saved by the forest department in West Bengal. The large water-body impounded upstream of the Teesta Barrage at Gazalduba is now a famous and popular spot for wildlife photographers. In the recent records of the Task Force constituted in 2010 for reviewing the needs of Project Elephant the name of Teesta Corridor does not figure in the list of threatened elephant corridors in India.

About the Author :

Shri Vinod Rishi IFS retired from the Indian Forest Services in 2006. He gradauted from IIT-Delhi. He served West Bengal Cadre in the Sunderbans, Darjeeling, Jaldapar, Singalila, Buxa & Neora Valley and in Central Government Posts including, first Director of Project Elephant (from 1993 to 1998), Director, I.G. National Forest Academy, Dehradun and finally as Addl. Director General (Wild Life) MOEF, Govt. of India

MISSION BLACK PANTHER

Adikarthik Shankar
Flat No. F-1203, Sterling Terraces Appartments
100 Feet Ring Road, Banashankari, 3rd Stage, Bengaluru - 560085

A 'black panther' is not its own species—it's an umbrella term that refers to any big cat with a black coat. The condition is caused by the agouti gene, which regulates the distribution of black pigment within the hair shaft. It is the most well known in leopards, the coloring comes from a surplus of melanin and an animal with the condition is known as'melanistic' . Just because black panthers are dark in color doesn't mean they do not have spots, they are just harder to see. When their coat catches the sunlight in a certain way, you can see their spots very distinctly.

I have been visiting Rajiv Gandhi National Park, Kabini since several years. Initially for many years the mission was to see a Tiger and leopard in the wild and in their natural habitat. It took me nearly 4 years to see a tiger and to see a leopard it took a year more. The real curiosity started when I heard a Black panther was sighted and every visit after that was mainly to see the ever elusive black panther.

Normally I use to stay for 3 days which comes with six safaris. I missed it narrowly on my previous trips which further enhanced my interest.

This time my dad who is also a wildlife lover has decided to go for longer stay to increase the chances and booked at JLR for 5 nights stay which effectively means 10 safaris. I was really thrilled and told myself that this time there could come the moment I have been waiting for years. Open skies and moderate temperature, overall a pretty good weather further added to the hope.

We embarked upon this difficult but possible mission of getting a glimpse of the ever elusive Black Panther on 4/2/2018 morning from Bengaluru. It took us about 4 and a half hours to reach JLR Kabini. Could not hide my excitement and very quickly got ready and started counting the time, the afternoon safari starts at 3.00 p.m. and was there near Golghar by 2.30 p.m. itself. Our safari started as scheduled and when the jeep entered the forest from the

first entry point towards Hosakere Tiger tank, I started praying for good luck. The forest had turned dry and fallen leaves had turned the open areas to yellowish. I had not seen kabini like this in my previous visits. The trees with virtually no leaves had turned the ever green bushy forest in to an almost see through kind. Even the prey density appeared very thin, may be they have moved deeper to somewhat greener grassy areas. Saw few langur monkeys sitting on the ground and playing, they had become a bit bold now, they sat on the safari tracks and won't give way till the jeep ccme very close. The Jeep driver and Naturalist checked several waterholes and we were checking the tree branches hoping to sight predators. But no such luck even after 2 hours of drive and we felt the forest was very calm and the business was as usual for preys grazing whatever little green was left. At around 5.15pm near the tiger tank powerline, some warning calls of spotted deer started to occur, so suddenly we all started switching our camera on and became attentive. The warning calls started growing louder and became quite strong indicating some movement of a predator. Our jeep driver, naturalist decided to position our vehicle on safari track nearer to the area of action and hoping to see some predator. Even the langur monkeys started giving warning calls. We waited there for 5 minutes and we were getting impatient. All sort of thoughts were moving in my mind; whether our location is right or what if the predator moves out and crosses on the other side and so on. But suddenly the majestic big cat, a tigress, appears from the bush with a spotted deer faun in her mouth. My God ! This was the first time I had seen the tiger with a kill which is a rare event and I felt I was so lucky to be there. We all clicked some nice photos, she even turned and looked at us as if to pose with the kill. Very majestic and bold but she was in a hurry to take her prize catch to a safer place to enjoy the evening snack. We all got good sighting for a few minutes and the trip's first safari was quite a fruitful one. We thought she will cross the area and move towards double salt pit, so we waited there but she did not show up.

Next day morning game drive went dry without any sightings of big cats but was very refreshing . It was very cold in the morning but we went prepared with warm clothings so it was fine. Back from the safari after very tasty and filling break fast we just sat out side our tent enjoying the view. Suddenly we saw some birds on the tree in front and after a close view I concluded they were Grey Malabar Hornbills. Enjoyed shooting a few pics. After few minutes one more guest appeared..Spotted eagle. A good make up for a dry safari.

The third game drive was also non eventful. We did hear continuous alarm calls of spotted deer near seegur tank but no luck. Since it was also 6.15 p.m. we had to call it off.

Our fourth safari also went dry. The black panther was not sighted by any vehicle so far. Normally once any vehicle sights the blacky, chances of sighting enhances since it stays in the tourism zone for a few days.

We entered the forest on our fifth game drive with lots of hope and tried a lot looking for the ever elusive black panther. Around 4.30 p.m. we came to know from the other vehicle that a tiger crossed the road and was moving towards the water hole. All of a sudden a tiger appeared and stepped in to the water hole to quench its thirst and also very lazily cooled off for a few minutes. We got a good view but the distance was a lot so we could not get a good photo even from a 500 m.m. lens. This afternoon was a bit warm which made us to go to other water holes for checking any sort of activities.

Towards the end of the game drive we saw an elephant at the tiger tank. It came, drank water and dipped itself into the cool water; it was really a good experience. No black panther but a satisfying safari.

Half of the game drives were over. I started becoming nervous. To add to it, I saw the sky was becoming grey with lot of clouds. In every trip to Kabini one thing which bothers us the most is the unseasonal rain. This trip we never expected any rain since it was winter. Rain will normally reduce the sighting chances drastically. At around 2.00 a.m. it started raining and may have rained for an hour or so. However when we started our sixth game drive into the forest in the morning, the sky was clear, but the tracks were wet and the forest was a little foggy. We entered the forest a little late due to one of the guest coming late; but we never thought it would prove so costly. The vehicle which entered first sighted Black panther for almost 10 min which was walking on track and later went into the bushes. We waited there

for 30min hoping it would come out and cross to the other side but to our bad luck, it crossed the road from a place which was 20metres from where we were waiting.

It was a dilemma. On one hand I was disappointed on the other hand we now knew the exact location and the chances were much brighter. In our next safari we tried to focus on the same area where we heard that it entered. The naturalist informed us that it comes here in search of a leopardess for mating and normally stays there for a couple of days. But we could not spot it and on the way back again we saw the same tiger in the seegur tank.

We all were very much sure about its location since some alarm calls from barking deer were heard and were circling the same area. Towards the end of the safari we saw few jeeps waiting near KV power line and when we neared we also could hear continuous alarm calls of the langur monkey. We waited patiently and after few minutes a leopardess came out of the bushes and crossed to other side in a flash. So our suspicions was confirmed. Evening we again tried but without any luck. I must admit that in the process of going behind Black panther we missed few good sightings of leopard and tigers. While I was so disappointed we came to know a tiger was walking on the safari tracks of the power line and luckily we were close by and moved towards the power line and soon we noticed a tiger was walking head on towards our jeep and we could click very good photos as it came very close to our jeep and went inside the bushes again. This was my best sighting of tiger in kabini and will cherish the same for long time to come.

We were left with only one more safari now and was desperate to extend our stay by one more day and my father obliged. We again missed it on our 10th safari and waited near the place where it had crossed but since too many vehicles were there it did not come out. Our evening safari was quite eventful. It started raining from the forest entry point itself and when we reached the place where it had crossed in the morning the thunderstorm became heavy and lasted almost an hour. We decided to stay there till rain stops and covered our cameras with protective covers and we were waiting patiently. While we were waiting we forgot about the mission and we were distracted by the talks amongst ourselves. I gave up!! So did the driver and the naturalist. But in the mean time the black panther had climbed up a tree and was relaxing. We never saw it. Then came another jeep, crossed us and stopped immediately and someone screamed "Black panther" pointing his finger in the direction of where it was. We all started looking in that direction and were delighted to see the Black panther resting on a tree branch. The rain was so heavy we could see it properly only after it stopped. The sun also came out. The lighting was good but far. It remained elusive. I could not have asked for more.

Thank God finally the mission Black panther was accomplished.

About the Author :

Adikarthik Shankar is a young nature lover, persuing a course in BSc. Forestry. His father Mr Ravi Shankar has been taking him on photographic tours to different national parks all across the country. They are planning to go for a trip to Kenya later this year. Adikarthik Shankar is aspiring to be an officer in the Indian Forest Services

NEELGAI AND WILD BOAR
WHY THE MENACE?
A HISTORICAL PERSPECTIVE AND A LOOK AT THE PRESENT TIMES AND WHAT HAS GONE WRONG AND CORRECTIVE MEASURES TO BE TAKEN

Mathen 'Rajeev' Mathew
Wildlife Consultant
6-3-912/1, Kapadia Lane, Rajbhawan Road, Somajiguda, Hyderabad - 580082
Email : wleco.rm@gmail.com

Historical Background:

Nilgai or Roz/Rui as it was known earlier, was historically a much hunted animal. Much before trophy hunting came into vogue, animals were measured by their overall size. These animals were hunted mercilessly for their meat and superior quality of leather ideal for shields and armour. Fearing that the Roz/Rui would be diminished in numbers or even exterminated; the Emperor Aurangzeb, through a royal decree rechristened it the Neelgai. Thereafter, it gained religious sentiment, being named after the cow – gai. With numbers low, the Neelgai then did not pose a problem to the farmers.

With the advent of the Europeans and especially the British, trophy hunting became a great pastime. It was also the era where explorers ranged far and wide, discovering uncharted lands and seas, and unique to them – birds and animals. Fortunes were to be made in the scientific discoveries. Archeology, paleontology and other sciences throve. The British started living in India for extended periods of time, and their love for hunting rubbed off on the many princely state rulers; and the dangerous game became their pursuit. Tigers, leopards, gaur, buffalo, elephant and a whole host of animals were brought under the ambit of 'fair game'. Spotted deer, sambar, four-horned antelope, blackbuck, ibex, markhor etc. were the game animals for they sported excellent antlers and horns and provided fresh meat at camp; and some like the tahr, markhor, bharal, ibex, and goral were difficult to hunt owing to the terrain they inhabited which, added to the thrill of the chase and excellent trophies they afforded at great physical strain.

The wild boar also found its place in this hall of prized game as pig sticking was another favourate pastime, considered next only to tiger hunting. The wild boar gave excellent account of themselves; sometimes unhorsing the rider with grievous injuries to both the horse and the rider. These were considered manly sport.

The neelgai did not figure in any of these classes of animals. They carried horns that were not considered a worthwhile trophy; their meat being dry and coarse was not considered a delicacy and so was seldom shot. If at all one was shot, it was to feed the camp followers, especially the large number of beaters required to shoot tigers. These animals are habituated to enter crops, being diurnal, were easily seen over long distances and could be shot away from the intended block where other large game – especially tigers – were to be shot.

Anthropomorphic interventions:

After India became independent, which was just after the World War II, surplus jeeps and weapons, a rush for land, and a total breakdown of the law, especially for hunting, till then the privilege of only the ruling class; saw all types of people hunting with cheap, military surplus rifles, ammunition and four wheel drive vehicles. Shoot-by-night was the order of the day, with, spotlight and torch wielding vehicle borne 'hunters' roamed the forests shooting any eyes that shone back at them. Game laws were thrown to the winds.

Habitat loss and change of land use:

To this, came another blow, the green revolution, where large tracts of forests were destroyed, be they wetlands – which were drained – and brought under paddy or grasslands destroyed for wheat, pulses etc., and the hills planted with huge estates of rubber, teak, tea, coffee and such similar. To be fair, these plantations were established by the British, but the greed of corporate business houses considerably extended the extant, both legally and illegally.

Orchards took over, and with the building of dams across rivers, land that was till then barren and fallow became arable. This pushed the wild animals to the fringes of what was historically their habitat and into whatever forests were left. Some areas became inhospitable and there were local extinctions. Cattle became another resource with the white revolution. Carnivores like tiger and leopard were shot as vermin, so too were foxes, jackals and wild red dogs. A bounty was paid for each animal so shot as vermin.

Wildlife protection:

The Wildlife Act (Protection) 1972 was promulgated, an Act in British India – the Indian Forest Act 1927 – revived to save the wildlife, which was met with huge resistance, but was however promulgated. This led to cessation of hunting over most parts of India, and withdrawn incrementally across the country. This aided the wildlife to recover in protected areas. The animals still faced many challenges, like loss of habitat, poaching, huge influx of cattle and other livestock that competed with the wildlife for fodder and water.

Effect of poaching:

Wildlife flourished though poaching was and still is a problem. The carnivores, then decimated started a rebound and by 1985 there was a healthy population, but the Chinese eye which caught the rhino earlier also caught the tiger; as they had killed and consumed most of theirs, the numbers of tigers started to fall once again, very little has changed thus far. Trends have now changed, with less of poaching, but with more of inter and intra specific rivalry and killings. So, while the carnivores suffered, there was a buildup of herbivores.

Enter the unwitting villains:

The neelgai which is an animal of the sub-arid to the semi-arid regions and the wild boar which is an animal of the temperate to tropical regions globally, preferring moist areas. Both these animals are highly adaptable and can thrive in a variety of conditions.

Deficient to non-existent predators:

In India, neelgai prefer sub-arid to semi-arid regions, while the wild boar ranges from the temperate to the semi-arid to the humid. Because of their habitat preferences, the neelgai has very few natural predators. Tigers are not found in the sub-arid regions and, with their numbers reduced to a fraction of their former muster, the dent they cause on the herbivore population is minimal. Leopards can hang on in a sub-arid region, but just. They are not big enough or

powerful enough to bring down an adult neelgai, but they kill their fawns, but again hardly a dent. Their only predator, the wolf has been decimated across most of its range.

The wild boar, though they are found in areas where there are both the major carnivores – tigers and leopards – account for a small number of their kills. These animals are tough, hard to kill, energetically fight back and are tenacious. Many tigers and leopards come out second best in fights they engage with, with wild boars. Therefore, again, these animals have predators, but the population grows because the predation is minimal. It is estimated that the Neelgai and the wild boar constitute about three percent of the predators' diet.

The human – animal – conflict:

The human – animal – conflict, especially with wild boar and neelgai arises because of a few factors that are easily seen on the ground. Sub-arid regions, due to the building of canals, the alluvial plains in the sub-arid and semi-arid regions have become the grain bowl of the country. The scrublands have been converted into fields and orchards. Fallow lands have been planted with *Prosopis juliflora*, which was a Government initiative which is an Invasive Alien Species, brought in to combat desertification and provide the rural masses with a fast growing high calorific wood fuel. The Prosopis has taken over the landscape, causing loss of ground water due to its evapo-transpiration. It is today globally recognized as a major factor in desertification, and has been planted globally in sub-arid and semi-arid regions; ironically to stop desertification.

Invasive Alien Species:

The Prosopis grows in small stands and offers some meagre shade in the sub-arid regions, enough for the neelgai that are really resilient animals to begin with. They can go without water for a few days, drawing all their hydration from the fodder they eat. These animals are both grazers and browsers, so can make do with a lot of variation in their diet.

With the change in land use the neelgai found ample forage of high value nutritional food in the fields and with this they became more fecund losing very few fawns to diseases and predation. Their numbers steadily grew, their name giving them added protection, especially in the North of India where the cow is held sacred. They, being animals of the absolute drylands throve with the intervention of the anthropomorphic land use change. The fallow lands planted with a scattering of the Prosopis gave them cover to fawn. Wolves that once roamed these plains were mercilessly exterminated as they were suspected of carrying off children and killing the sheep and goats. Therefore, the predator that would have taken the fawns, juveniles, sub-adults and adults has disappeared leaving a huge ecological chasm. With no predators in their sub-arid fastness they simply multiplied, feeding in the fields and retiring into the fallow lands.

In the semi-arid regions, they were also prey for the tiger and the leopard and probably a few might have fallen to the wolves and wild red dogs, though to my knowledge so far I have not seen them preyed upon by either. But, with a very small predator population that does not exclusively kill and eat neelgai, there is hardly a dent in the population. Here, the cover is more substantial than the sub-arid regions. With a richer food source and hardly any predator worth the name they thrive. Now, with their numbers swollen, with the law and the religious sentiment protecting them, their numbers have probably exceeded the carrying capacities of their locations. Bloated populations are a result of high value fodder available.

Crop damage:

With each animal consuming anywhere between five and eight kilograms of fodder a day, one can imagine the damage done to the crops and fields. Add to that the trampling of the fields. With their pointy hooves, they dig into the ground, and when chased, run, digging their hooves deep into the ground, in the process digging out and scattering all that which they trample on. With a herd of some ten animals, roughly sixty kilograms are eaten and an equal amount trampled underfoot. This will be a huge loss to the farmer. The collateral damage is also there. When they wade from field to field, they also trample in their wake fields not yet ripe, or of those planted with inedible crops–cotton for example.

Wild boar are different altogether. They breed very rapidly, are omnivorous, very tenacious and have few predators. They, like the neelgai are not shy of entering human habitations with the exception of attacking anyone standing in their way. Their attacks can be fatal and many have sustained grievous injuries. A sow with piglets is very relentless and savage in her attack, and so is a boar when being chased off.

The *Prosopis* has greatly favoured the wild boar. In semi-arid and sub-humid areas where wild boars are found, the *Prosopis* grows like a blanket. Acres of land are overtaken by the Prosopis, and wild boar with their thick hides finds it the most impregnable and safest of places to retire. They nest in it also. These areas are far removed from forests and even leopards find it difficult to get in because of the thorns that can incapacitate them.

Diet, change in habitat and resilience:

They, being omnivorous feed on anything, from grains and pulses, fruits in orchards to offal and waste discarded by meat and food processing units. They do not eat paddy, but because of standing water, love to wallow in it, in the process destroying crops that they do not eat anyway. They also trample underfoot a lot more than they eat.

Both, wild boar and neelgai have moved out of the forests to feed on the crops grown in the fields. The habitat has been altered to their liking. High yielding crops, impenetrable brush, the law itself and religious sentiments have paved for them the best way possible giving them a lot of shelter.

If a census were carried out for these animals in the forests, it will yield fewer. Those found in the forests will be in the fringes where they will bed for the day – in the case of wild boar – and sally forth into the fields and orchards as dusk falls. The majority of them have relocated to the fallow lands for cover and food in the fields and orchards. Further, there are no predators to contend with, especially in the rural environment.

Prosopis, to be propagated, the seeds need to be treated by boiling in water or other mechanical and chemical processes. Wild boar eat the pods and as the seeds pass through its digestive tract, it is processed and is broadcast over distances with its own manure, giving it a great start.

Interbreeding in wild boar:

The numbers of wild boar have swelled in the recent past probably due to the interbreeding with domestic/feral pigs reared in an almost wild state in most of the villages across India. Domestic pigs have larger litters than wild pigs. Wild pigs have a litter size of four to six – (The book of Indian Animals by S.H. Prater), while domestic pigs have an average litter size of twelve, range being from ten to fourteen piglets per litter. (PMCID: PMC3096772 Maternal investment, sibling competition, and offspring survival with increasing litter size and parity in pigs (*Sus scrofa*) Inger Lise Andersen, Eric Nævdal, and Knut Egil Bøe).

The large numbers of wild boar seen today – especially around habitations – are probably due to this interbreeding and therefore hybridization. Due to this hybridization, the litter sizes have also gone up considerably, and, with no predators their numbers will only rise. This could also be one reason why wild boars are seen to inhabit the farms, orchards and sometimes even villages. There is a greater breeding opportunity for the young and also old boars excluded by more vigorous younger boars; the fields, farms and orchards provide a richer food source, and this habit is especially well documented. Many males of several species including elephants occupy farms which provide them a nutritional supply of food. (Male elephants were responsible for 88% of all (crop raiding) incidents. – Pattern of crop raiding by Asian Elephants in human-dominated landscape in southeastern Sri Lanka – Sampath K.K. et al. Gajah 34 (2011) 20-25)

Retaliation by villagers against wildlife depredations:

Villagers, to protect their crops from depredation from wild animals – especially wild boar – illegally fence their farms collectively or individually with live wire, the power being tapped illegally from power lines and nooses made from ordinary G.I. wire and binding wire and two-wheeler clutch wires. There is now an alarming trend of laying the electrified lines along the dry nullahs where wild animals come to drink at stagnant pools, take mud baths or use it as a crossing. Here, the killings are indiscriminate, as all species of animals are targeted, fuelling probably an underground bush-meat trade. The root of all this can be traced to the conflicts arising from crop-raiding wild animals, especially wild boar and neelgai.

This form of laying live wires in forested areas causes extensive damage to the local wild life. Scavenging animals like the jackals also fall victim to these traps as the electricity will be still surging through the bodies of the dead animals. Iconic species like the tiger, the leopard, the bear etc. have been killed in these live wire traps. There are also cases of human causalities due to the indiscriminate use of the live wire traps.

Wild boar and domestic pigs – including the hybrids, are known carriers of several diseases that are communicable to both livestock and humans. Among the many that are fatal to humans are psudorabies and encephalitis.

Though "Tasty," Wild Pork May Be Dangerous

In the new research, DePerno and colleagues found evidence of exposure to the parasites Toxoplasma gondii and Trichinella in the blood of 83 wild pigs killed in North Carolina between 2007 and 2009.

The results are very similar to those of studies conducted in other parts of the country—including Texas and South Carolina—that show feral pigs could be disease vectors, DePerno said.

However, this is the first time scientists have found these particular parasite species in wild pigs, he said.

Although T. gondii and Trichinella have been eliminated in domestic swine, more people these days are hunting wild

pigs for food, DePerno said. "They're pretty tasty—more flavorful than domestic pigs."

People would most likely be infected by eating parasite-ridden meat. Once transmitted, both parasitic species can invade muscle tissue and organs and cause flulike symptoms, DePerno said.

More than 60 million men, women, and children in the U.S. already carry the Toxoplasma parasite, but very few show symptoms, because a healthy immune system usually keeps the disease in check.

Still, toxoplasmosis—the disease caused by T. gondii—is a leading cause of death due to food borne illness in the United States, according to the U.S. Centers for Disease Control and Prevention (CDC). The organism is especially toxic to pregnant women and those with weak immune systems.

Trichinella infections can also range from mild to severe, with the worst cases causing potentially fatal heart and breathing problems, according to the CDC. Even in moderate cases, fatigue, weakness, and diarrhea can last for months.
By Christine Dell'Amore, National Geographic
News PUBLISHED MAY 3, 2011

The risk of zoonosis:

With numbers swelling, the neelgai and wild boar have become a menace to the farming community. Little known though or under published is the fact that they are known carriers of many diseases and parasites, some of which are lethal to livestock and humans. They are known to contaminate water bodies with fecal bacteria and also increase the turbidity of the water. Their omnivorous diet also put to risk ground nesting birds. Wild boar are swine and are therefore prone to carry many zoonotic diseases. More than twenty such diseases caused by bacteria and viruses are listed as fatal to humans, leading the list being encephalitis and psudorabies.

Population control:

Urgent measures need to be taken to control the population. Relocation is not a viable option as it is an intensive operation, with extensive need of man-power and resources and expensive in operation, and finally suitable habitats are already brimming. Contraceptives are difficult to administer, and, there is no way of knowing if an animal has been treated previously so. The cost of administering it would be prohibitive. Tranquilizing animals carry their own risks, as animals can die because of shock or other related reasons, thereby defeating the very purpose. And once captured, what does one do with them? Till such time that alternate methods are found, culling should be viewed as a simple wildlife management tool.

Chemical neutering:

Chemical neutering is now being talked about. It is a long term project with no tangible results in the short term. How the chemical neutering agent will affect the predators and scavengers does not seem to have been addressed. In India, where the animals are anyway poached and eaten, what will its effects be on the unborn children; will it cause birth defects? Will it harm the pregnant women? What about prepubescent children and adolescents, especially? How will it affect the general population that has traditionally been eating them – especially tribals? How will it be administered to the target species? If it is scattered as food, what precautions are to be taken to avoid non-target species from consuming it? An honest bio-safety evaluation is a requirement that should be stringent. Diclofenac did in the vultures, and scientists had no clue till the entire population was all but decimated.

Culling is necessary as it will reduce the population dramatically since it involves killing of the animals. Culling should be monitored, with an off-take of at least 25% of the animals in a region. This will have a direct bearing on the overall situation, which can then be monitored with an annual off-take of 20%.

Culling of animals is best done during the preparing of the land, planting and sowing of the fields, for at this time wild boars are known to raid the newly planted fields for the seeds and the newly germinated shoots. During this time there is better visibility. After four weeks or so of planting, the crops fill up and are high and this hampers visibility.

Appendix I

S.No.	Local Name/s	English name	Scientific name
1.	Nilgai/Neel Gau/Rui/Roz	Bluebull	*Boselaphus tragocamelus*
2.	Jungli Suar	Wild boar	*Sus scrofa*
3.	Bagh/Sher	Tiger	*Panthera tigris*
4.	Tendwa/Chita/Chitra	Leopard	*Panthera pardus*
5.	Chital	Spotted deer	*Cervus axis*
6.	Sambar	Sambur	*Cervus concolor*
7.	Chow-singha	Four-horned antelope	*Tetracerous quadricornis*
8.	Kala harin	Blackbuck	*Antelope cervicapra*
9.	Sakin/Skin	Ibex	*Capra ibex*
10.	Markhor	Markhor	*Capra falconeri*
11.	Gaur/Katupothu	Gaur	*Bos gaurus*
12.	Janglee Bhains	Buffalo	*Bubalus amee*
13.	Hathi/Annai	Elephant	*Elephas maximus*

About the Author :

Mathen 'Rajeev' Mathew is Wildlife consultant and his core is working and alleviating human animal conflicts, livelihoods and eco-restoration. He also is an R&D consultant for Tac Sim. He was a field Biologist with the Bom. Nat Hist. Soc. Later he was also the Hon. Treasurer of the Rowing Federation of India. He was an Expert Member of the combined state of AP and Telangana (Andhra Pradesh). He is an Expert member of the Telangana State Biodiversity board, he was also an Expert Member of the National Biodiversity Authority constituted for Red Sanders. He was also an expert knowledge partner with centre for Innovations in public systems, Hyderabad, (CIPS) for "Developing" a comprehensive greening policy for Andhra Pradesh.

About the Photographers :

Photos of Neelgai by
Mr R. D. Singh Chandella

Photos of Wild Boar by
Mr Zaheer Bakshi

JACKAL JOTTINGS: THEY SHARE OUR SPACE TOO

Malaika Mathew Chawla
Parvatibai Chowgule College, Goa
Email: chawlamalaika@gmail.com

Two years ago I shifted to my new home in South Goa, to start life afresh. Amongst the many new things I became acclimatized to, is the piercing cry of the jackals that live in my village. The golden jackal or Asiatic jackal forms a part of the semi-urban landscape of many villages in Goa. They are group-living animals. They persist in human-modified habitats like crop fields as well as fragmented patches of scrubland, mangroves and hills. Jackals have also been sighted near garbage dumps in big cities like Margao, in graveyards and even on beaches. Even though jackals can adapt to changes in the land, these animals require natural sites free of human interference for denning purposes. One might come across a jackal crossing a road once a while, a pair of jackals camouflaged against the long stalks of dry grass or even a pack foraging on the garbage dumped in the fields. But jackals are mostly elusive- jackal pups and the dens are their well-kept secret. Jackals in Goa are often mistaken for foxes and sometimes wolves. In Konkani, 'kolo'- the term meant for jackal- is wrongly translated into English as fox.

The Koles of Saligão

Folklore and popular myths often portray jackals as being cunning and sly. The inhabitants of Saligão village are referred to as uxellantle kole (foxes in the sugarcane field) or 'the koles of Saligão' (foxes of Saligão). In his book 'Land of the Sal Tree', Father Nascimento Mascarenhas, explains how Saligaokars got stuck with this nickname. When the villagers began the plantation of sugarcane, the jackals would come down from the hills into the fields to feed on the ripened crop. The farmers were successful in keeping them away during the day, but then the jackals started foraging at night. The villagers formed groups of guards and each group had to guard the fields at different times. These guards took shelter in palm leaf tents known as khompteo that were set up in the fields and chased away any unsuspecting jackal with sticks and stones. Hence Saligaokars protected their sugarcane plantations by 'outfoxing the foxes'.

Living with Jackals

But how much do we really know about our neighbours in the wild? As a part of my third year BSc project in Zoology, I decided to study jackals in my neighbourhood, along with few of my classmates. The study area comprises of Sirlim and Deussua villages of South Goa and these reflect the archetypal Goan village landscape. Local knowledge and information about the jackal is important to understand public attitudes towards jackals, type of interaction with the animal and any kind of traditional knowledge. We undertook house to house questionnaire surveys in all wards. The first reaction to jackals was almost always an exaggerated "Tim sodanch kulio ghaltai" (They are always howling). Often, they would even imitate the calls in an animated manner, followed by embarrassed giggles. A few people would also talk about jackals stealing their piglets and chicken once a while. A migrant worker who works in a dairy farm in Deussua encounters jackals on a daily basis: "Abhi sham ke chaar baje kutton ke jaise idhar udhar ghoomenge aur phir raat ko bahut awaaz karenge" (At 4 in the evening they will be roaming around like dogs and then they will make a lot of noise at night). It is especially interesting to listen to their cries as soon as the church bell rings at 6:30 in the evening or when crackers are burst during village festivities. A man whose house is next to a field, said that he throws his chicken waste for the jackals when they make "too much noise".

Jackal Cough

The Konkani term for whooping cough is kolo khonkli, literally translating to 'jackal cough'. The origin of this Konkani term is an interesting one. Kids and adults suffering from whooping cough give out a whooping sound after each cough. This sound has been compared to the cries of the jackals, hence the name jackal cough. In some villages, grandmothers and grandfathers previously believed that when a jackal cried, the howls heard by small children could cause them to suffer from kolo khonkli. As a preventive measure, elders would blow into the ears of these children as soon as the jackals begin to howl. But if the child does happen to suffer from kolo khonkli or ubush (asthma), a concoction called kolo soro was believed to cure the cough. People had differing views about the making of kolo soro..

One man told us that when he was fifteen years old, in the late 1970s, he was employed by an old lady in the village to catch jackals and kill them for meat. His friends and he would take dogs along to search for jackal dens, close to the river. The dogs would sniff out the denning site and give away the location of the puppies. One blow on the head with a wooden stick was enough to knock them unconscious and even kill them. The jackals would then be tied and with a thick rope and slaughtered into pieces. One jackal puppy would fetch them ten rupees while an adult jackal was worth fifteen rupees. The old lady would ferment the meat for 8 days and then add hot cashew feni to it in a distillation unit. Toddy tappers in the village would normally make and sell kolo soro. Another man of the same village told us that people would eat jackal meat some sixty years ago. According to him, kolo soro was made up of jackal blood distilled with feni. Jackals would make their dens in the mangrove embankments or bandhs. The opening of the den would be filled with hay and chillies and then a fire would be lit. The smoke would suffocate the jackals and consequently the jackals tried to escape out of the den. In this process, they would be caught and a blow on their heads with a stick would finally kill them. The blood would be used in the making of kolo soro. Several other home-made remedies for kolo khonkli included honey, feni, sugarcane syrup (kakom), pineapple juice, and the blood of other wild animals like mongoose, monitor lizard, and rats.

A Good Omen

We also come across people talking about hyenas being present in the village at one point of time. They recall the calls of the jackals being different from that of the hyenas'. The call of the hyena was associated with misfortune and death. "Ganvant kitem vait zata, konui morta, tednam bali rodta. (The hyena would cry if there was a death in the village)". In contrast, jackal howls were considered a good omen by some. There are also children stories revolving around jackals. In one story, the village kids would ask the jackal to throw down some jamun berries or jamblam from the tree. In another story a jackal was caught stealing sanna (sweet rice cake) from an old lady's house. To teach him a lesson, she lights his tail on fire.

A mating pair of jackals in a paddy field in Deussua

Safeguard of our Urban and Rural Wilds

During day time field observations in Deussua, we observed jackals foraging on garbage dumped at the side of the road and in the field. A rivulet of the Sal that passes through the village is a popular dumping ground for slaughter waste that is tied up into cement sacks and discarded. Carcasses of cattle are often dumped in the mangroves. These human-generated food sources are available to village dogs, jackals, birds of prey and other scavengers. Jackals and other mesocarnivores are rarely appreciated for their ecosystem services of waste removal and reducing the spread of disease. Mesocarnivores are particularly important in areas where there are no longer apex predators- leopards and tigers- or obligate scavengers like vultures. Jackals were common throughout the state of Goa but in the recent past, its population has undergone a significant decline.

Panchayats should play a crucial role by avoiding mindless concretization of bandhs, land filling, hill cutting, mangrove felling and other destructive modes which pass for developmental work. Lack of awareness and will among Town and Planning, policy making, municipal and panchayat bodies, in particular the Biodiversity Management Committees (BMCs) result in these bodies becoming mere tokenism. Further, immunization and sterilization programmes for community/stray animals are not undertaken by most panchayats resulting in their abuse as well as threat to some of the wildlife. Rapid road construction and accompanied apathy towards the non-human species are wreaking havoc resulting in what is gently termed as 'road kills'. Construction of overpasses, underpasses and road signs can help reduce wildlife-vehicle collisions. Crucial habitats like rivers, mangroves, and scrubland shelter a diverse range of creatures like leopard, smooth coated otter, marsh crocodile, palm civet, monitor lizard, mongoose, and several other birds, reptiles, amphibians, fish and insects. These habitats also support local livelihoods like fishing, aquaculture and livestock rearing. We are closely intertwined with the land and our natural heritage. It's high time we value and protect our urban and rural wilds.

Slaughter waste discarded into the mangroves and river

About the Author :

Malaika Mathew Chawla is a third year Bsc student of Zoology at Parvatibai Chowgule College in Goa. Waking up to jackals howling, peafowl crying, squirrels chirruping and the endless chatter of the jungle babblers; She has been fortunate to witness the wonders of the natural world from the doorsteps of her home. She has volunteered in local conservation efforts, camera trapping activities with Nature Conservation Foundation in Bangalore and an otter-fisheries interaction project in Goa. She is especially interested in understanding human-wildlife interactions and co-adaptation.

TRACKING THE STRIPED CAT

Monitoring a tiger in elephant country

Sagarika Phalke
A Rocha India, Bannerghatta - 560076
Email : sagarika.phalke@gmail.com

"There is a tiger in Bannerghatta…" I still remember the day when these unbelievable words were uttered to me, it was the 26th of June, 2015. I was making my way from Conoor to Wellington in the Nilgiri hills, blissfully enjoying the scenic landscape and being enveloped by the cool climes of the hills; when I got a call from my colleagues at Bannerghatta National Park (BNP) informing me of the arrival of the iconic tiger. No sooner were these words spoken, I wanted to rush back to Bannerghatta to see and understand what brought this charismatic animal to our neck of the woods.

BNP is more famously known for its larger inhabitants the Asian elephant, which seem to dominate the people's knowledge of fauna in this landscape. Other carnivores from the felid family such as leopard, jungle cat and the rusty spotted cat have been seen and their presence has been documented in the park; however, the occurrence of a tiger was noteworthy. It is not unknown for these large cats to wander into Bannerghatta as it is contiguous in the south to known tiger habitats such as Cauvery Wildlife Sanctuary (CWS) Karnataka - the two previous known instances of tigers coming to Bannerghatta were recorded in 2009 and 2012 respectively. The movements of these animals were only tracked for a couple of days after which all information with regard to them ceased, assuming that they had moved back somewhere to the south from where they had come. However, what made this visit interesting was the presence of the tiger in the national park for over a month.

On 1st May, 2015 pugmarks of a tiger and a wild pig kill were reported by forest beat watchers in a wildlife range of Bannerghatta adjoining CWS. This wasn't unusual, as it was assumed to be a transient individual, probably exploring the area. However approximately two months later pugmarks of a large cat were found by the mahouts of

Bannerghatta Biological Park (BBP), which lies in the northern most range of the national park; and is closest to the expanding city of Bangalore! Subsequently as time progressed the forest beat staff of all the four ranges of Bannerghatta and personnel from the BBP also reported frequent tracks and kills; as well as direct sightings of the animal. This was quite different from the previous two instances where only indirect signs of the animals were noticed for a short period of time- but here we had an animal that seemed to be making a few rounds - had a tiger come to stay in Bannerghatta?

Tigers are largely known to be territorial which is a trait that occurs in both sexes; male tigers have been found to operate over larger territories as compared to females. The exploration of a new viable habitat by a tiger is possibly due to it being an old individual whose established territory has been taken over by a younger interloper; or by a young individual seeking to establish a territory. It was important for us to gain demographic and identifying information about this individual that would have yielded clues as to its presence in Bannerghatta.

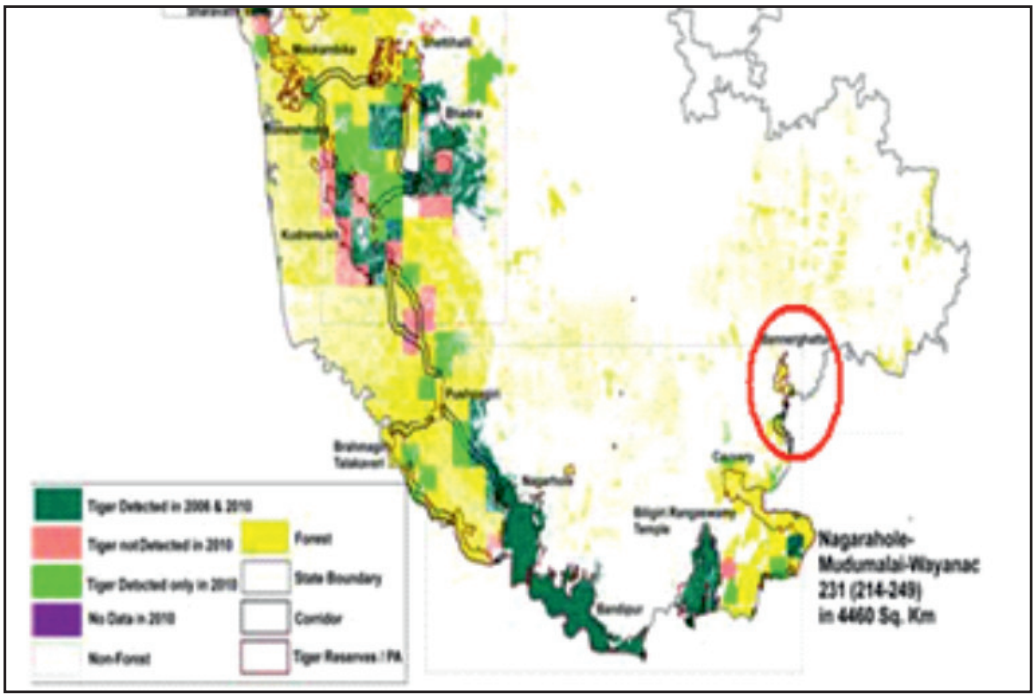
Thus, began our seven-month odyssey with this elusive and charismatic cat in Bannerghatta. In low density areas where the possibility of a direct encounter

is low, one must rely on indirect signs such as scat, kills and spoor to understand the movement patterns of the animal and to a small extent certain identifying information. Every on-ground report was followed and verified; and information was collected on the indirect evidences of the large cat. Based on the pugmarks that were measured it seemed that the animal was an adult tiger, possibly a male; however, unless it was photo-documented it could not be positively identified.

We randomly set up camera-traps along trails where we had noticed a preferred movement of the animal. Wading through months of disappointment at not being able to document it and broken camera-traps (we were after all in elephant land and elephants are curious creatures) he was finally photo captured 6 months after our journey began. It was a young male who seemed to be doing well for himself (evident by his kills and their frequency) in this new landscape that he had charted out for himself.

It has been two years since he first came to BNP and his presence has been predominantly restricted in the northern range of the park. It appears that the lure of the captive female tigers at the BBP have influenced his movements within the area. However, being physically separated from these females through deep trenches and high fences I wonder what the future holds for our striped 'Romeo'. Could the lack of wild females in the park be a motivation for him to seek other viable pastures which contain breeding mates? Or could other young females who too are seeking out new territories for themselves follow the same path that this male has taken to Bannerghatta to create a potential breeding pair? If so, the future could hold the prospect of a new generation of tigers, the family sustaining themselves on the wild ungulates and wandering livestock that this landscape holds. We look forward to the possibilities in seeing our Romeo of Bannerghatta having a family.

Whatever the future may hold in all its conceivable ways, we will be monitoring his whereabouts as long as it is possible and needed, in a land we hope he has come to call his own.



About the Author :

Sagarika Phalke currently works as a Program Officer for A Rocha India focusing on the conservation of the Asian Elephant and the mitigation of Human-Elephant Conflict at Bannerghatta National Park. With a Masters in Counseling her interest lies in the human dimension towards conservation and human- wildlife interactions. She is also keen in studying the intraspecies interactions in social mammals and hopes to pursue her further studies on it.

About the Photographer :

Avinash Krishnan undertook his Masters program in Wildlife Management and Conservation from the University of Reading, UK. He has over seven years of experience in the field of ecology and wildlife conservation, and has published numerous articles and research papers on mammals, birds and reptiles. His focus lies on large mammal conservation through technology-based approaches. He pioneered the use of camera trap technology to document small mammal diversity at Bannerghatta National Park. His interest has been nature conservation through research and education. He currently works on urban school environmental programs with students of various age groups. He is keen on pursuing his doctoral studies on Elephant Ecology and Conservation, more specifically on the issue of Human-Wildlife Conflict.

SIGHTING BARKING DEER, *Muntiacus muntjak* (ZIMMERMANN, 1780) AT SAHASTRADHARA, DEHRA DUN (UTTARAKHAND) WITH SYSTEMATIC ACCOUNT, DISTRIBUTION AND FLORAL COVER

Akhlaq Husain
(Former Scientist – E, Zoological Survey of India)
41, Hari Vihar, Vijay Park, Chakrata Road, Dehra Dun – 248001 (Uttarakhand)
Email: drakhlaqhusain@gmail.com
and
Abdurrahman
Uttaranchal College of Science & Technolgy, Nagal, Sahastradhara, Dehra Dun - 248013 (Uttarakhand)
Email: abduldun@gmail.com

ABSTRACT

The paper deals with the first time recording of *Muntiacus muntjak*, the Barking Deer, from Sahastradhara, Dehra Dun (Uttarakhand) and its systematic account, description, distribution, habitat, food & feeding, breeding, behaviour, conservation status, threats and floral cover in the area.
Key Words: Sighting Barking Deer at Sahastradhara.

INTRODUCTION

The general mammalian fauna of Uttarakhand has always been an attraction to workers/naturalists in past (Lamba, 1977, 1987; Sinha, 1995a, b; Haleem, 2002; Haleem et al., 2014; 2002; Sati, 2002; Khati, 2004; Kushwaha et al., 2004, 2008; Sati & Tak, 2008, 2010, 2014) but no attention has gone on small pockets, like Sahastradhara, a nature's hub, in Dehra Dun and hence it is provided here.

Muntiacus muntjak, the Barking Deer, Male {Courtesy : Zaheer Bakshi, Dehra Dun}

Muntiacus muntjak, the Barking Deer, Male {Courtesy : Zaheer Bakshi, Dehra Dun}

Recently, deer and other wild animals have been sighted in Sahastradhara. The present communication deals with the sighting of *Muntiacus muntjak*, the Barking Deer and is being recorded here for the first time from the area with its systematic account, description, distribution, habitat, food & feeding, breeding, behaviour, conservation status and threats for the benefit of researchers and nature lovers. The floral cover in the area is specially provided as it is the basic food item/part of habitat of ungulates/herbivores.

Muntiacus muntjak, is one of the smallest species of Barking Deer with characteristic short antlers, large pre-orbital scent glands and visible canines in male. They are mostly found in hilly terrain.

SAHASTRADHARA: STUDY AREA

It is one of the most popular destinations among nature lovers. It is located in Lesser Himalaya, at the base of Mussoorie Hills, between 30°23′07.6″ N Latitude and 78°07′44.9″ E Longitude with altitude of 830 m above the sea level and lies at about 14 km, north-east of Dehra Dun city.

Sahastradhara, the 'Thousand Fold Spring' site, is an excellent warehouse of caves, sulphur springs, waterfalls, torrential stream, hilly terrain, green cover, natural beauty and steppe fields. Its name is derived from the fact that water literally drips/trickles down from thousands of limestone stalactites in the caves. The water contains Sulphur and is of great therapeutic value. The area is rich in Himalayan flora, especially medicinal plants.

Climate: Warm and temperate, with annual average temperature 20.5° Celsius and average rainfall 2750 mm (vide Climate-Data.Org).

Baldi River: It is the main stream, originating from the base of Mussoorie Hills and receives other small streams, falls and springs on way. It is typical torrential hill stream and a tributary of river song, joining at Maldevta. It is a life line for fauna and flora and wild animals around. During raining season the water flow increases and in turn the flora of the area increases significantly, which is good for ungulates, especially deer.

Floral Cover: (Bisht & Bhatt, 2012; Dtyani et al., 2016; personal observations):

Trees: *Aegle marmilos, Bauhinia variegate, Boehmeria regulosa, Cassia fistula, Cocculus laurifolius, Cordia dichotoma, Delonix regia, Ficus elasticus, Grevillea robusta, Jacaranda mimosaefolia, Mallotus philippensis , Melia azedarach, Phoenix dactylifera, Tamarindus indica,Tecoma stans, Phyllanthus emblica, Pyrus pashia, Pyrus pashia, Senegalia catechu* and *Syzygium cumini.*

Herbs/Bushes: *Thalictrum foliosum, Argimone mexicana, Cannabis sativa, Boehmeria platyphylla, Urtica dioica, Chenopodium album, Aerua lentan, Achyranthus aspera, Ameranthus spinosa, Areva spp, Aletrnanthera sessilis, Celosia argentea, Polygonum spp, Rumex spp, Corchorus capsularis, Sida spp, Abutilon indicum, Viola biflora, Coccinia grandis, Momordica charantia, Trichosanthus tricuspidata, Pyracantha crenulata, Mimosa pudica, Euphorbia spp, Phyllanthus amarus, Riccinus conmunis, Reinwardtia indica, Oxalis corniculata, Geranium wallichianum, Impatiens thomsonii, Apium gravelens, Gentiana aprica, Solanum spp (nigrum, xanthocarpum). Physalis minima, Adothoda spp, Dcliptera roxburghina, Jasticia adhatoda, Lepidagathis spp, Nepeta laevigata, Clerodendron infortunatum, Ocimum basilicum, Peristrophae binalvis, Ageratina adenophora, Anaphalis triplinervis, Artemisia spp, Bidens spp, Emilia sonchifolia, Sonchus asper, Cyperus rotundus, Asparagus racemosus , Dioscorea bulbifera, Woodfordia fruticosa, Centella asiatica, Ajuga bracteosa, Desmodium gangeticum, Flemingia stoobilifera, Chromolaena odorata (introduced), Gnaphalium lanatum, Boerhavia diffusa, Colebrookea oppositifolia, Ocimum sanctum, Cantharanthus roseus, Carissa opaca, Jasminum multiflorum, Fragaria indica, Silene indica, Evolvulus alsinoides, Peperomia pellucid, Anagallis arvensis, Stellaria media, Persicaria hydropiper,*

Muntiacus muntjak, the Barking Deer, Female {Courtesy : Dr. S K Gupta, W.I.I., Dehra Dun}

Muntiacus muntjak, the Barking Deer, Female {Courtesy : Dr. S K Gupta, W.I.I., Dehra Dun}

Peperomia pellucid, Murraya spp, Citrus limon, Sesamum indicum, Argemone mexicana, Calopteris procera, Opuntia spp, Cleome viscose and *Vitex negundo. Juniperus indiaca, Chrysanthemum spp, Cactus spp, Agave sisalana, Eupatorium adenophorum, Ficus palmata, Boehmeria platyphylla, Callicarpa macrophylla Hypericum oblongifolium, Pogostemon benghalense* and *Rubus biflora*

Climbers: *Begonia venusta, Coccinia grandis, Trichosanthes tricuspidata, Cissampelos pareira* and *Ipomea nil, Erianthus rufipilus , Chrysopogon fulvus, Micromeria biflora, Eriophorum comosum, Eulaliopsis binata, Erigeron montanus, Smilax zeylanica, Buddleja asiatica* and *Pogostemon benghalense*

Grasses: *Apluda anstata, Cynodon dactylon, Oplismenus compositus, Penninstum flaccidum* and *Poa annua.*

Ferns: *Adiantum spp.*

Agriculture Crops: *Brassica juncea (Mustard), Oryza sativa (Paddy)* and *Tricticum aestivum (Wheat).*

Exotic Plants: *Agerantia adenophora, Ageratum conyzoides, Amaranthus spinosus, Chromolaena odorata, Eupatorium odoratum, Euphorbia pulcherrima, Lantana camara, Parthenium hysterophorus* and *Stellaria media.*

SYSTEMATIC ACCOUNT, DESCRIPTION, DISTRIBUTION, CONSERVATION STATUS, THREATS AND OTHER ASPECTS OF Barking Deer, *Muntiacus muntjak* (Zimmermann, 1780)

Cervus muntjak Zimmermann, 1780. *Geogr. Gesch. Mensch. Vierf. Thiere,* 2: 131 (type-locality: Java, Indonesia).

Classification: Class: Mammalia Linnaeus, 1758, Order: Artiodactyla Owen, 1848, Family: Cervidae Goldfuss, 1820, Subfamily: Muntiacinae Knottnerus-Meyer, 1907 and Genus: *Muntiacus Rafinesque, 1815.*

Other English Names: Common Muntjac, Indian Muntjac, Red Muntjac, Mastreani Deer, Muntjac, Rib-faced Deer.

Hindi Name: Kakar.

Sighting Details: 08:45 AM, 18th July, 2016, at Nagal, opposite Uttaranchal College of Science & Technology, Sahastradhara, Dehra Dun (Uttarakhand); data by second author (AR); first author has also seen them browsing and grazing in the area at many occasions; also sighted at Maldevta, an adjoining area.

Description: Body golden tan above, lighter below, tail white edged and under, legs and head little darker (colour may change to greyish-brown or dark brown with age/season); coat with short, soft and dense fur but ears with very little hair; a pair of massive pre-orbital scent gland, located in slits on the face in line with antler pedicles.

Male: Larger and little darker in colour than females; having short antlers, consisting of 2-3 points, protruding from long hair-covered bony pedicels/burrs on forehead, which extend down each side of face as bony ridges (hence also called 'Rib-faced' Deer), they grow annually; upper canines well developed, curving sharply outwards from the lips; pre-orbital glands comparatively larger than in females.

Female: Comparatively smaller and lighter in colour than males; having tufts of fur and small bony knob-like burrs on head instead of antlers; pre-orbital glands smaller than in males.

Measurements: Height at shoulder 38-66 cm, length 89 cm -1.35 m, antlers 2.5-5.0 cm (rarely up to 15 cm), upper canines 2.5 cm (Wikipedia); height 50-75 cm, antlers 5-8 cm (rarely above 13 cm), pedicle 8-10 cm (maximum 17.8 cm), weight 22-23 kg (Prater, 1971); height 45-58 cm, length 80-100 cm, tail 11.0-18.5 cm, adult weight14-18 kg (Sati & Tak, 2010, 2014).

DISTRIBUTION: Up to 3,500 m (IUCN Red List).

Dehra Dun: Sahastradhara and around.

Elsewhere in Uttarakhand: Corbett Tiger Reserve (Lamba, 1977, 1987; Khati, 2004; Sati & Tak, 2008; Kushwaha et al., 2008); Chamoli, Dehra Dun, Haridwar, Pauri, Tehri, Uttarkashi, Almora, Nainital, Pithoragarh and Rajaji Tiger Reserves (Sinha, 1995a,b; Joshi & Singh, 2008); Kedarnath Wildlife Sanctuary (Haleem, 2002; Haleem et al., 2014); Uttarakhand (Sati, 2002); Ranikhet forest of Kumaon (Kushwaha et al., 2004); Chamoli, Dehra Dun, Haridwar, Pauri, Rudraprayag, Tehri and Uttarkashi; Almora, Bageshwar, Champawat, Nainital, Pithoragarh and Udham Singh Nagar (Sati & Tak, 2010); Jhilmil Jheel Conservation Reserve, Haridwar (Sati & Tak, 2014).

Elsewhere in India: Almost throughout the country except Jammu & Kashmir and desert region (Alfred et al., 2002); Deccan plateau, Karnataka, Maharashtra, Malabar Coast, West Bengal and Northern India (Sati & Tak, 2010).

Elsewhere: Bangladesh, Bhutan, Cambodia, S. China, Indonesia (Bali, Borneo, Java, Lombok, Sumatra and other Islands), Laos, Malaysia (peninsular), Myanmar, Nepal, NE Pakistan, Sri Lanka, Sunda Islands (Malay Archipelago) and Vietnam.

Habitat: Mostly dense deciduous forests and good vegetation cover in hilly terrain with water points.

Food and Feeding: They are both browsers and grazers. Prefer to forage at higher sites than at river bed sites except if having taller and denser vegetation, feeding on a variety of diet, like grasses, ferns, herbs, bushes, trees twigs and barks, sprouts, fruits, seeds etc. They, also sometimes, take birds' eggs and small mammals and hence considered omnivorous. They sometimes display even scavenging behaviour, feeding on carrion. Their large canines help in retrieving and ingesting food.

Breeding: They are seasonally polygamous. Females mature from first to second year of age and are polyestrous, each cycle runs for about 14-21 days and an estrus lasts for about two days. The gestation takes 6-7 months and single offspring is born at a time, may be twins sometimes, in dense forest for safety from predators. The young ones stay with mother for about six months and thereafter leave for independent life.

Behaviour: They are solitary and quite territorial. Adult males usually mark their territory by rubbing the area/grass etc with pre-orbital glands and often fight with each other for territories and preferred female, using their short antlers and even sharp canines. They are active both during day and at night. They emit, typical dog-like alarm 'bark' when sensed some danger or presence of predator around and hence named 'Barking Deer'. Barking may carry on continuously for up to an hour or so.

Conservation Status: International Union for Conservation of Nature Red List Category- Least Concern; Indian Wildlife (Protection) Act, 1972- Scheduled III; Conservation Assessment and Management Plan Workshop Report, 1998 (CAMP)- Lower Risk, Least Concern (Nationally); Data Deficient (Globally).

Threats: Hunting for various reasons (sport, meat, skin and menace for agriculture) and predators.

Remarks: For systematic status, followed Wilson & Reeder (2005).

CONCLUSION

Muntiacus muntjak, the Barking Deer has been recorded for the first time from Sahastradhara.

ACKNOWLEDGEMENTS

The author (AH) is thankful to the Director, Zoological Survey of India, Kolkata for encouragement and the Officer-in-Charge, Northern Regional Centre, ZSI, Dehra Dun for library facility. The second author (AR) is also indebted.

REFERENCES

Bisht, A.S. and Bhatt, A. B., 2012. A contribution to the medicinal plants of Sahastradhara, district Dehradun, Uttarakhand (with ethnobotanical notes). J of Drug Delivery & Therapeutics, 2 (5): 114-120.

Dhyani, S., Saini, N. and Tiwari, N., 2016. Community level floral diversity in Sahastradhara Forest, Dehradun, Uttarakhand. Octa Jour. Env. Res., 4 (3): 237-242.

Haleem, A., 2002. M. Sc. Dessertation. Aligarh Muslim University, Aligarh (vide Haleem et al., 2014).

Haleem, A., Ilyas, O., Syed, Z., Arya, S. K. and Imam, E., 2014. Distribution, status and aspects of ecology of mammalian species in Kedarnath Wildlife Sanctuary, Uttarakhand Himalayas, India. J. Mater. Environ. Sci., 5 (3): 683 (683-692).

Joshi, R. and Singh, R., 2008. Asian Elephant (Elephas maximus) and Riparian Wildlife Corridors: As case study from Lesser Himalayan Zone, Uttarakhand. The Journal of American Science, 4 (1): 63-75.

Khati, A. S., 2004. Fauna of Corbett National Park & Tiger Reserve: 1-234. Pelican Creations International, Delhi.

Kitchener, D.J., Boeadi, Charlton, L. and Maharadatunkamsi, 1990. The wild mammals of Lombok Island. Records of the Western Australian Museum 33: 1-129.

Kushwaha, S. P. S., Khan, A., Habib, B., Quadri, A. and Singh, A., 2004. Evaluation of Sambar and Muntjak habitats using geostatistical modelling. Curr. Sci., 86 (1): 1390-1400.

Kushwaha, S. P. S., Khan, A., Habib, B., Quadri, A. and Singh, A., 2008. Habitat preference assessment of the Tiger and its prey ungulates in the Corbett Tiger Reserve. In: Fauna Corbett Tiger Reserve. Conservation Area 35: 31-66.

Lamba, B. S., 1977. Fauna of Corbett National Park. Cheetal, 18 (3-4): 42-47.

Lamba, B. S., 1987. Fauna of Corbett National Park: Mammals, Birds and Reptiles: 86 pp. Zoological Survey of India Publication.

Sati, J. P., 2002. Uttarakhand ke vanya prani. Cheetal, 41 (1-2): 82-87 (in Hindi).

Sati, J. P. and Tak, P. C., 2008. Mammalia. In: Fauna of Corbett Tiger Reserve. Conservation Area Series, 35: 76 (63-82). Zoological Survey of India Publication.

Sati, J. P. and Tak, P. C., 2010. Mammalia. In: Fauna of Uttarakhand. State Fauna Series 18: 50 (27-76). Zoological Survey of India Publication.

Sati, J. P. and Tak, P. C., 2014. Mammalia. In: Fauna of Jhilmil Jheel Conservation Reserve (Uttarakhand). Conservation Area Series, 50:15, 25 (13-32). ZSI Publication.

Sinha, N. K., 1995a. Mammals (Mammalia). In: Fauna of Rajaji National Park. Fauna of Conservation Area 5: 18 (9-23). Zoological Survey of India Publication.

Sinha, N. K., 1995b. Mammalia. In: Fauna of Western Himalaya, Part 1, Uttar Pradesh. Himalayan Ecosystem Series: 205, 211 (201-214). Zoological Survey of India Publication.

Srinivasulu, C. and Srinivasulu, B., 2012. South Asian Mammals: Their Diversity, Distribution and Status. Springer. ISBN 978-1-4614-3448-1, ISBN 978-1-4614-3449-8 (eBook).

Wilson, D. E. and Reeder, D. M. (Editors), 2005. Mammal species of the World: A Taxonomic and Geographic Reference. Vol. 1: 667, Johns Hopkins University Press.

About the First Author :

Akhlaq Husain, Former Scientist-E/Joint Director, Zoological Survey of India, having vast field and research experience since 1964 (still continuing on his own), on various animal groups with good number of publications in journals/books of repute, higher research guide leading to Ph.D., Environmental Impact Assessment studies, member editorial board of various Journals, review of scientific papers from India and abroad and teaching. Described many new fish species, adding to science. Attended various seminars/symposia. Participated in Antarctic Expedition for zoological studies. Worked on Mauritius and Arabian fauna also. Awards: Merit Promotion at Zoological Survey of India and 'Special Honour' for scientific studies at Antarctica and 'Appreciation Certificate' for outstanding achievements by Vice Chancellor, Aligarh Muslim University.

About the Co-author :

Abdurrahman, Assitant Professor, Zoology Department, Uttaranchal College of Science & Technology, Dehradun, Uttarakhand, is a keen wildlife enthusiast with interest in wild animals, like fishes, snakes, mammals and some insect groups.

BULBULS OF THE DOON VALLEY

Abhai Mishra
Deal Colony, Raipur Road, Dehradun - 248 008

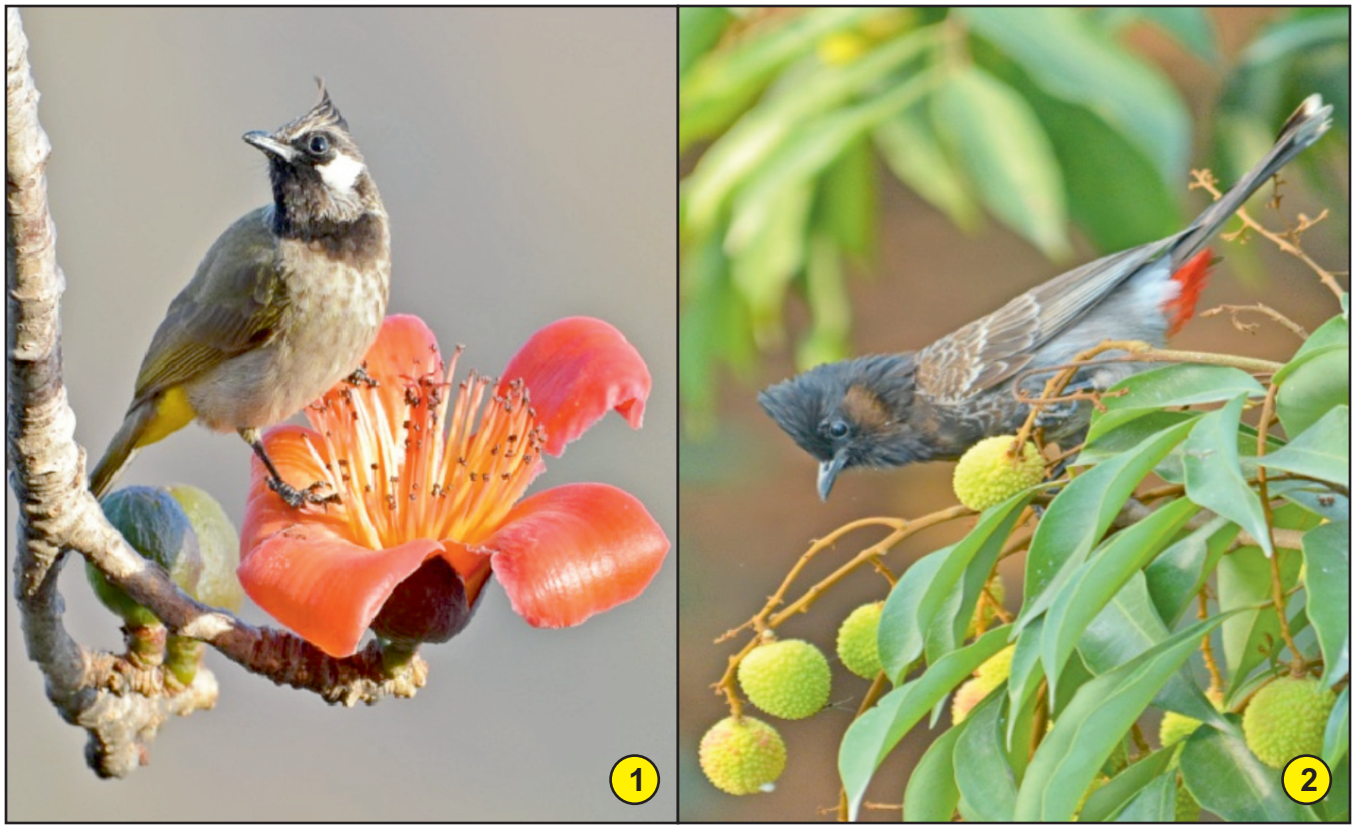
Bulbuls are medium sized passerine songbirds and belong to the family *Pycnonotidae*. They are mostly tropical and sub-tropical birds with distribution ranging from Africa, Middle East, Asia to Japan. Bulbul, word is derived from Persian, which means *Nightingale*. There are around 150 species of Bulbul distributed in 27 genera worldwide. Some of them are called greenbuls and brownbuls. They are very noisy, active, plain-coloured birds of the size of 5 to 11 inches. Bulbuls have long tails, small, slender bill, relatively delicate legs with short rounded wings and prominent bristles about the base of the top mandible.

Bulbuls are not very-brightly coloured having occasional reddish markings with distinctive crest on the top of the head. The nest is built mostly in a bush or small tree having shape of a small cup. They generally lay two to four eggs and both male and female care for the young. The food which they consume includes seeds, fruits, and small insects. They are highly vocal with their call described as nasal and are generally monogamous.

The Doon valley is abode to many birds as it attracts summer, winter as well as altitudinal migrants. It offers diverse habitat including river streams, sparse vegetated areas, broad-leaf forests, agricultural stretches, thick forests etc. for the avian. The seven type of Bulbuls found in the valley are -

1. Himalayan Bulbul (*Pycnonotus leucogenys*) - The body colour is greyish-brown with a black-crest on the head. It has a distinct yellow undertail covert and conspicuous white cheeks.

2. Red-vented Bulbul (*Pycnonotus cafer*) - The upper parts and breast are dark sooty brown exhibiting scaly appearance. The shiny black head with small crest is very prominent. The under tail covert is red thus giving its name. It is highly aggressive and invasive in nature.



3. Ashy Bulbul (*Hemixos flavala*) - It is a medium to large size dark conspicuous bulbul with crown feathers raised into a rounded crest. It has olive-yellow wing panel with a white throat.

4. Mountain Bulbul (*Ixos mcclellandii*) - It has a brownish mantle with rather long bill. The head sides and breast are bright rufous in colour. The throat is distinct white-streaked and greyish in colour while the under parts are chestnut toned.

5. Red-whiskered Bulbul (*Pycnonotus jocosus*) - They had a distinct black head-crest and prominent red patch behind the eye along with small white patch on lower ear covert.

6. Black Bulbul (Hypsipetes leucocephalus) - They has all black plumage with red legs, feet and bill exhibiting pale fringes to undertail coverts.

7. Black-crested Bulbul (Pycnonotus flaviventris) - The head is black crested while the body is of different shades of yellow. The eye is strikingly yellow while the beak and legs are black. Around the vent the bright yellow colour fades to duller yellow.

About the Author :

Abhai Mishra he is a scientist with Defence Research and Development Organisation. He is a keen wildlife photographer and life member of WPS. As a philatelist he specializes in the area of Indian Antarctica, Uttarakhand and WW-2 POW camps in India. Besides writing scores of philatelic articles in leading newspaper and journals he has authored two books namely "Uttarakhand - A philatelic Journey" published by Department of Posts and "Indian Antarctic Expedition - Philatelist's Guide". He has been to Antarctica with twenty-first Indian Expedition as communication officer. He is also a heritage enthusiast and conducts heritage walks for "Been There, Doon That?" to spread heritage awareness among the citizen of Doon valley. Other than that he is also an avid birdwatcher and loves walking.

AVIAN FRIENDS

Dig Vijai Singh
Uganda
Email : digvijai56@yahoo.com

The National Geographic Society has in partnership with National Audubon Society and Cornell Lab of Ornithology, declared 2018 the year of the bird; a year long effort celebrating and protecting birds.

Year 2018 also marks the centennial of the migratory bird treaty act - the most powerful and important bird-protection law ever passed.

To quote Lovejoy "If you take care of the birds, you take care of the big environmental problems in the world".

I thought it would be appropriate to share some of my photographic experiences with you and is a small contribution by me towards my avian inspirations, Members of WPS and our journal 'CHEETAL' and hope that members join in the Great Backyard Bird Count - the beauty is that Birds can be found everywhere.

I now live in the pearl of africa the country which has a recorded number of 1061 species of birds and is considered a Birders' Paradise.

As on date 3464464 Individual Birds Counts have been recorded / contributed towards the week of February 16-19 February for the 'Great Backyard Bird Count'

Birds are important as they keep our ecosystems in balance providing pollination, dispersal of seeds, scavenge carcasses and recycle nutrients back into our earth.

I grew up on my father's library of Robert Ruark, H. Rider Haggard, Willard Price, Kuki Gallmann, Fredrick Courteney Selous, J A Hunter, Peter Hathaway Capstick, Wilbur Smith and not to mention the numerous national geographic journals and knew that one day Africa would be on my travellist.

From the first time I set foot on the Dark Continent in 1994, realization dawned that one day an extended visit / stay would always remain on my Bucket List.

As in all matters of nature there are the 'HUNTERS' and the 'HUNTED'

1. African Harrier Hawk - (*Polyboroides typus*) least concern. Omnivorous and an example of convergent evolution. Ususual trait is the double jointed knees enabling it to reach into holes & cracks of prey.

2. African long crested eagle - (*Lophaetus occipitalis*) least concern. a sit & wait hunter. 100% diet is rodents & birds

3. Secretary Bird - (*Sagittarius serpentarius*) vulnerable category. Hunts on foot & kill prey by stomping. Importance of snakes in diet is over emphasized. Domesticated by farmers to combat pests.

Importantly they also feed our spirits making the passage of the seasons anticipated and so joyful and moving us to create poetry and art, inspiring us to flight as they fly reminding us that we are not only on, but of, this earth as they are.

To quote Eunice Cenrohlavek "Birds matter because they symbolize the very essence of freedom. They can fly free from backyard to backyard ignoring the fences neighbors build between them and from country to country ignoring our cultural differences. Free to pursue life, liberty and happiness"

The 'HUNTED'
4. Hunters Sunbird - (*Chalcomitra hunteri*) least concern. Nectariniidae family. Red listed by the iucn.

5. Variable Sunbird - (*Cinnyris venustus*) least concern. Sexual dimorphism characteristics of ornamentation. Feed largely on nectar but also take insects when feeding young. The beauty and grace of birds is something one can only wonder at - as maybe in all living things.

6. Arrow Marked Babbler - (*Turdoides jardinelli*) name is derived from its peculiar plumage. Social bird living in groups that defend their territories fiercly.

7. Grey crowned crested crane - (*Balearica regulorum*) omnivorous. The national bird of uganda. Omnivorous. Faces threat from pesticides pollution. Breeding displays involves dancing, bowing, jumping with booming & honking calls.

8. Ross's toraco - (*Musophaga rossae*) frugivorous. Very little sexual dimorphism. Yound reach sexual maturity in a year & remain near their parents in extended groups of upto thirty birds.

The world today is looking towards creating Bird Friendly Communities and building Avian Architecture for many bird species the loss of natural places to nest, feed and water is resulting in population declines and many falling under the CE(Critically Endangered)

9. Scavengers/carrions - Marabou Stork - (*Leptoptilos crumenifer*) reach heights of 60" & weigh upto 9 kg with a wing span of 12'. The naked head and neck is adaptations to its scavenger status. Would we all be like this one day along with the birds?

I remember the day I shot an Owl my Air Gun was confiscated by my father. We were allowed to "Shoot for the table only" and the importance of "carrion/ scavengers" was explained to me.

What if we did not have them? The African proverb says "How you run your life, that's how your clock will run"

Some of the birds already falling under the CE category - Indian griffon, forest owlet, magenta petrel, white backed vulture, hooded vulture, red headed vulture, karthala svops owl, california condor, kori bustard, arabian bustard, himalyan vulture - the list just goes on ad nauseam.

Suffice it to say that over 95 species under carrions/scavengers are today listed under CE category.

And a further 21 of the insectivorous out of the 230 species are listed as endangered - imagine one day all those ants crawling up your pants?

As the African proverb says "You always learn a lot when you lose" But is that the only way of learning?

10. Greater blue-eared starling (*Lamprotornis chalybaeus*) Looks I get from my wife when I cross the line on "Bird Watching"

Maybe there is hope in the African proverb "However long the night, the dawn will break"

About the Author :

Dig Vijai Singh has been working in tea gardens in Assam(1979-2003) & Africa since 2003 (Malavi, Zimbabwe, Tanzania, Kenya, Ethiopia and Uganda). He loves nature and wildlife. Born and brought up in a family of Hunters/Talukedars of Awadh. He grew up on the smell of cordite and gun oil when his father was running a Shikar Company called 'Spots and Stripes'. However he has preferred to shoot with a camera rather than a barrel since the early '70's. Loves the call of nature. He is currently based in Uganda.

FIRST CASE OF WOLF ATTACK ON HUMAN IN WESTERN RAJASTHAN, INDIA.

Aazad Prakash Ojha and L.S. Rajpurohit
Dept. of Zoology, J.N.V.U. University, Jodhpur (Raj., India)
Email : aazad.ojha@hotmail.com

In the western part of Rajasthan state (India), there is a huge desert called as The Great Indian Thar Desert. It extends over about 446,000 km^2area, of which about 208,110 km^2 area lies in India and rest in Pakistan. Thar Desert represents diverse and unique biodiversity and it harbors some endemic species which include critical endangered great Indian bustard (*Ardeotis nigriceps*). Thar Desert has many species of mammals which include Indian grey wolf (*Canis lupus*), Jackal (*Canis aureus*), the striped hyaena (*Hyaena hyaena*), the Indian desert fox (*Vulpes v. pusilla*), wild boar (*Sus scrofa*),black buck (*Antilope cervicapra*), Chinkara (*Gazella g. benneti*), blue bull (*Boselaphus tragocamelus*), the desert cat (*Felis lybica*) etc.

The grey wolf locally called as 'Naar/ChaliNaar' is the only predator in Thar Desert. The wolf population in the Thar Desert is dwindling and are present in very less number. Their conservation in Thar Desert has become an important challenge for researchers. Grey wolf is shy in nature and generally, they avoid humans. They are nocturnal, but we have also observed its diurnal activity. They generally hunt for deer, blue bull, sheep, goat etc.

Pic.1: Raju Singh (Victim)

No history of wolf attack on a human has observed in past records, but recently on 11th January 2018, first case of wolf attack on humans has happened inthe Bara Kalan village (tehsil- Bhopalgarh, Jodhpur). We went to the incident site, surveyed the area and interacted with the villagers and the victim. Raju Singh (local shepherd) on whom wolf attacked (pic. 1), said as he was doing daily routine activity, wolf stealthily approached him and he noticed goats started showing strange behavior and as he looked back, the wolf attacked on him. Wolf bit him and somehow he managed to escape from wolf grip and since he was having axe in his hand using to cut tree branches, he then hit on the neck of wolf. It died (pic.2) on spot and there after dead body taken away by forest department, Jodhpur for postmortem.

Pic.2: Dead wolf body

On studying this case, we have surmised as to why this man was attacked by a wolf. Just ten days before this incident, six wolf cubs were rescued by the forest department team at the Ramrawaskalan village next to Bara Kalan village on 1st January 2018, stating that these cubs are orphan. This attack could be linked with this rescue operation. This putting in captivity of wolf cubs could be the main cause of behavioral change in parent wolf. About talking to the villagers regarding this, they said wolf never attacked on them, they just roam around and attack on their sheep or goat only. They never felt threatened by wolf and it has happened first time.

In many areas of western Rajasthan it has disappeared.The conservation of wolf is needed in western Rajasthan, as it is being only top-level predator in this region and their counts left are very less. Wolf captivity in this area should be prohibited.

About the Author :

Aazad Prakash Ojha is a CSIR SRF (Research Scholar) at Dept. of Zoology, Jai Narain Vyas University, Jodhpur (Raj.). He is a field biologist, working on ecology and conservation of large mammals in Thar desert. Beside this he is a conservationist and does wildlife photography. He does awareness programmes for conservation of wildlife in western Rajasthan. He has good knowledge of reptiles, birds and mammals. He has completed his education from Jai Narain Vyas University, Jodhpur (Raj.).

RELATIVE CONDITION FACTOR IN *Labeo bata* (Ham) FROM RIVER GHAGHRA

Alpana Parmar
P.G. Department of Zoology,
MLKPG College Balrampur, U.P.
Email : alpanaparmar406@gmail.com

ABSTRACT

The condition in fishery biology generally signifies heaviness relative to expected average weight at any given length of the fish. As the specific gravity of the fish changes considerably throughout the life, depending upon general well-being, feeding conditions and gonadal development, so the condition of fish varies greatly. The relative condition factor 'Kn' of *L. bata* was high in smaller-sized group. The value decreases up to the length of 190 mm of both sexes and thereafter, a sudden increase was followed by a decrease in subsequent size group. The fishes were found to attain peak condition 3 times up to the length group of 450 mm.

Studies on the monthly fluctuations in condition indicate that the condition generally starts to increase in March and reaches to maximum during June and then decreases suddenly during July and August. While condition with gonads was found to increase during March to June, the condition minus gonads continued to decrease.

The fluctuations in 'Kn' values of *Labeo bata* were found to be related with gastro-somatic/gonado-somatic indices of the fish. Condition with gonad of the fish increased from March to June, while the condition minus gonad decreased during this period. Sudden decrease in 'Kn' values of *L. bata* during July and August were found due to exhaustion of the fish by spawning. The condition of *L. bata* was rather uniform during rest of months of the year i.e., from September to February.

Key words: *Labeo bata* , relative condition factor 'Kn', gonado-somatic index, gastro somatic index

INTRODUCTION

The changes in condition have generally been analyzed by means of condition factor, coefficient of condition or pondral index (Hile, 1936). Kestevan (1947) and Le Cren (1951) have discussed method of calculated weight in two ways. The first method is based on the cube law and is termed as condition factor (K). The second method is based on the exponential equation $W = aL^n$ (where, W and L are weight and length of the fish respectively and 'a' and 'n' are constants to be determined empirically, 'a' is the intercept and 'n' is slope) and is termed as relative condition factor. In the first method condition factor (K) is being calculated as $K = W/Cl^3$ and if C is equal to 1, assuming that the specific gravity of the fish is unity, then $K = W/Cl^3$. The value of 'K' is generally multiplied by 100 to obtain the value of 'K' into a round figure as $K = 100W/L^3$ (Hile, 1936).

In the second method, however, the relative condition (Kn) is calculated by the formula $Kn = W/ aL^n$, where aL^n shows the calculated weight (from the regression equation) and W is the observed weight. This equation may also be written as observed weight/calculated weight (W/Wo) (Le Cren, 1951). The value of 'Kn' fluctuates around one and when it departs from one it represents the deviation from the regression of the weight on length as proportional part of the standard 1.0. This variation in weight is not associated with length but with genetic variability, variation associated with food supply, gonadal condition and parasitism (Blackburn, 1960). He mentioned that variations cannot be evaluated with the help of the condition factor unless 'n' is actually 3, which is rarely the case. Le Cren (1951) also concluded that 'Kn' is better that 'K' in many ways. Therefore, in case of Labeo bata, relative condition factor (Kn) has been calculated so as to obtain information about the life history of the fish from river Ghaghra.

MATERIAL AND METHODS

The material for the present study was obtained from River Ghaghra at Dhakherwa fish market from January to December 2006. Three hundred specimens were used in the present investigation. The method of Le Cren (1951) was followed for the calculation of relative condition factor (Kn) of *Labeo bata*. The observed weight of individual fish was divided by the mean weight at corresponding length calculated from length-weight equations, i.e., log W = log a + n log L and 'Kn' values were obtained. These values were grouped separately according to sex, size and season.

The weight of gonads of both the male and female fish were taken and expressed as percentage of body weight (gonado-somatic index). For each month the percentage of gonadal weight of the fish was subtracted from the average value of 'Kn' for that month. These values were termed as condition minus gonad and were plotted to determine whether the weight of the gut has any influence on seasonal changes on 'Kn' of the fish. The gastro-somatic indices (gut weight expressed as percent of the body weight) of the fish were subtracted from the condition minus gonad and gut. This value was also plotted.

OBSERVATIONS

A sudden increase in the value of 'Kn' was observed at the size class 209 mm in females and 230 mm in males., and this was followed by alternate decrease and increase in the 'Kn' values up to the length of 450 mm (Table 1, Fig.1).

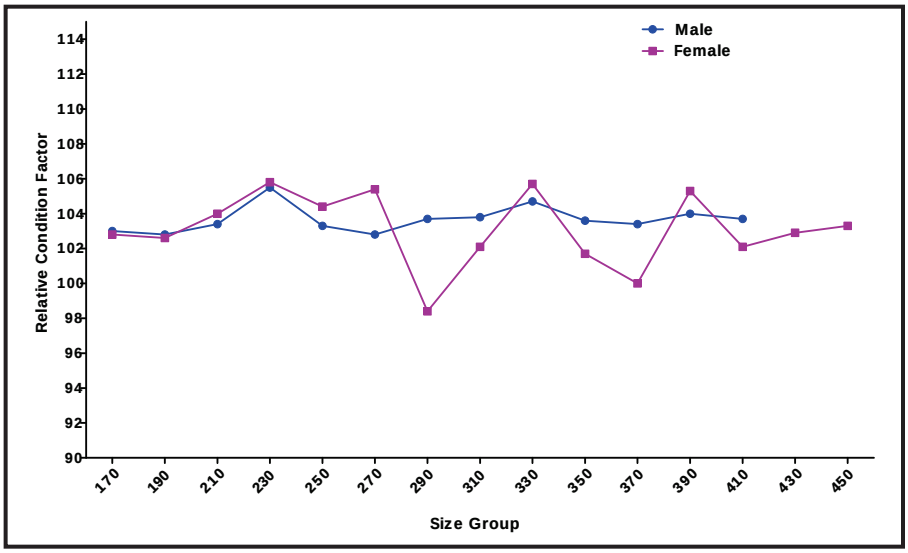


Fig. 1 : Mean 'Kn' values of *L. bata* at different size groups.

Table – 1 Mean 'Kn' Values of *Labeo bata* at different size groups

Size Group	Mean 'Kn' Value	
	Male	Female
150-170	103.00	102.80
171-190	102.80	102.60
191-210	103.40	104.00
211-230	105.50	105.80
231-250	103.30	104.40
251-270	102.80	105.40
271-290	103.70	98.40
291-310	103.80	102.10
311-330	104.70	105.70
331-350	103.60	101.70
351-370	103.40	100.00
371-390	104.00	105.30
391-410	103.70	102.10
411-430	--	102.90
431-450	--	103.30

The gonado-somatic indices of *L. bata* showed seasonal fluctuation in both the sexes. It started increasing from March and achieved its maximum level in May in case of males (Table 2, Fig. 2) and in June in case of females (Table.2, Fig.3). The gastro-somatic indices dropped suddenly in July and August. From September to January it almost remained constant. The seasonal changes were found to be more pronounced in females than in the males (Fig.3).

Seasonal fluctuations in relative condition can be seen in Table.2 and Figs.2 and 3. High values were recorded in the months of April, May and June when the fish was fully ripe. Just after the spawning, relative condition factor declined (July and August).

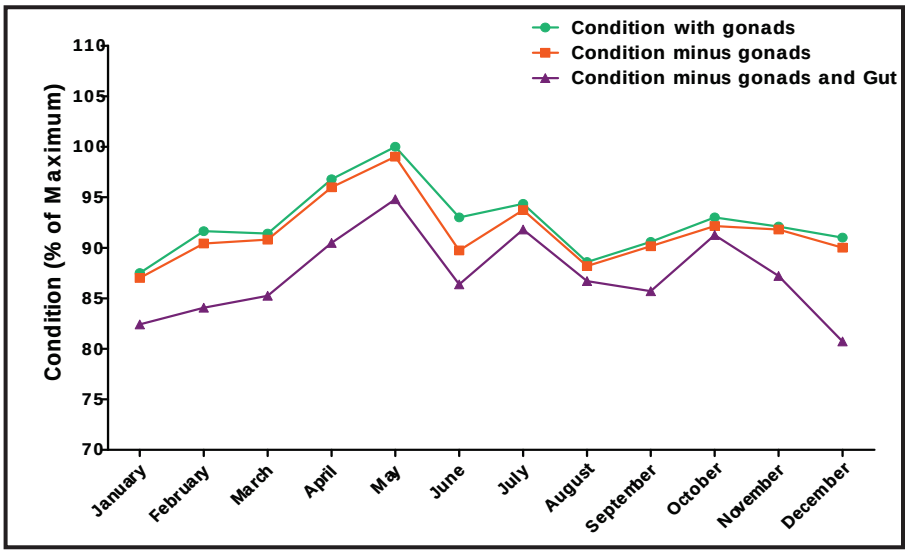


Fig.2: Seasonal fluctuation in condition with gonads, condition minus gonads and condition minus gonad and gut of male *Labeo bata* from river Ghaghra

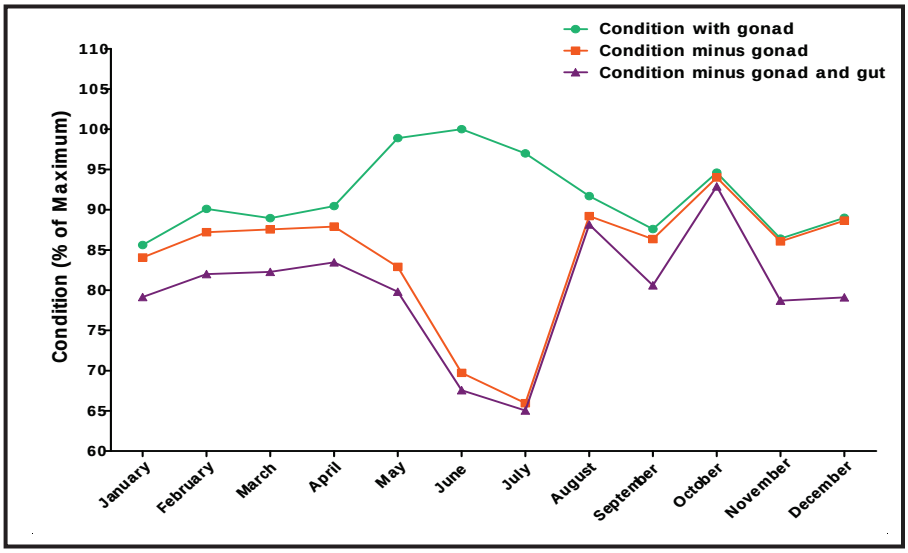


Fig.2: Seasonal fluctuation in condition with gonads, condition minus gonads and condition minus gonad and gut of female *Labeo bata* from river Ghaghra

Table – 2 Condition with gonad, without gonad and without gonad and gut of *Labeo bata* from river Ghaghra during the year 2006

Months	Male					Female				
	Condition (% of maximum)	Gonado-somatic index	Condition minus gonad	Gostro-somatic index	Condition minus gonad and gut	Condition (% of maximum)	Gonado-somatic index	Condition minus gonad	Gostro-somatic index	Condition minus gonad and gut
Jan	87.50	0.48	87.02	4.60	82.42	85.62	1.57	84.05	4.90	79.15
Feb	91.65	1.23	90.42	6.35	84.07	90.10	2.90	87.20	5.20	82.00
March	91.40	0.60	90.80	5.55	85.25	88.95	1.40	87.55	5.27	82.28
April	96.78	0.80	95.98	5.50	90.48	90.45	2.55	87.90	4.45	83.45
May	100.00	1.98	99.02	4.21	94.81	98.90	16.00	82.90	3.10	79.80
June	93.00	3.27	89.73	3.35	86.38	100.00	30.28	69.72	2.15	67.57
July	94.35	0.62	93.73	1.92	91.81	97.00	31.05	65.95	0.91	65.04
Aug	88.60	0.40	88.20	1.50	86.70	91.70	2.50	89.20	1.04	88.16
Sept	90.59	0.43	90.16	4.99	85.71	87.60	1.25	86.35	5.99	80.60
Oct	93.00	0.57	92.16	1.17	91.26	94.60	0.60	94.00	1.10	92.90
Nov	92.10	0.29	91.81	4.60	87.21	86.40	0.35	86.05	7.35	78.70
Dec	91.00	0.09	90.01	9.28	80.73	89.00	0.35	88.65	9.64	79.10

From April to June the condition minus gonads of females decreased considerably and the condition with gonads increased during the same period. The decreasing condition with gonads during July and August was very clear while the condition minus gonads did not show any significant decrease. During rest of the months, there was no significant difference between condition with gonads and condition minus gonads. Similar pattern was observed for males. Gastro-somatic index in females was found to decrease considerably during April to July. In other months gastro-somatic indices of both the sexes were found to be high.

Labeo bata (Hamilton-Buchanan)

The relative condition factor 'Kn' of Labeo bata was observed to be high in juveniles (170 mm), dropped in the next size class and again were high at the size of 230 mm. High values in juveniles may be related to their high rate of feeding while high values at 210 and 230 mm are most probably due to attainment of first sexual maturity. Similar observation has been reported in *L. rohita* and *C. mrigala* (Khan, 1972) in *L. gonius* (Nisha Shukla, 2002).

Fish samples collected from Ghaghra river.

DISCUSSION AND RESULT

Pantulu (1961) suggested that this increase and decrease in the value of 'Kn' during different length groups of both the sexes can be related to the number of spawning during the life span of the fish. In case of *L. bata* there were 3 peaks and 3 valleys upto the length of 450 mm which showed that this fish spawned three times before reaching this length. The present observations fully agree with the findings of Chatterjee (1981), Pantulu (1961), Khan (1972), Chatterjee et al., (1976), Khumar (1985) and Nisha Shukla (2002) in riverine fishes only. In Labeo calbasu upto the length of 570 mm 3 peaks were reported which revealed that this fish also spawned thrice before reaching to this length (Ramamohan Rao and Rao, 1972), while Khan (1972) reported 5 peaks in case of *L. rohita* upto the length of 900 mm.

The monthly fluctuations in 'Kn' values are known to be influenced by two factors. viz. sexual cycle and feeding rhythm. The majority of authors opinioned that fluctuation in 'Kn' values are closely related to the sexual cycle of the fish and this increase and decrease in 'Kn' is due to increase and decrease in weight of gonads before and after the spawning (Le Cren, 1951; Pillay, 1953; Sarojini, 1957 and Pantulu, 1961). Whereas it has been suggested by other workers that monthly fluctuations in the condition factor are more closely related to the feeding rhythm than to the reproductive cycle and is independent of it (Hile, 1948; Qasim, 1957; Blackburn, 1960 and Bhatt, 1971).

In *L. bata* the seasonal variations in 'Kn' values revealed that both sexes attain peak condition in June. This rise in 'Kn' value from April to June corresponds with the period of maturation of gonads as it is closely associated with rise in gonado-somatic indices during these months. The abrupt fall in condition during July and August may be because of the spent condition of the fish. Slight increase in condition of *L. bata* during October to February with a peak in February may be due to active feeding during these months when plankton, the main food of the species, is abundantly available.

During the months of April to June the increase in condition with gonads was due to increasing gonads weight while the continued decrease in condition minus gonad indicated that certain amount of growth potential was sacrificed for the gonadal development since ovary weight increased enormously as compared to fish weight. This contribution for the sexual building up was more pronounced in females than in the males.

REFERENCES

Bhat, V. S. 1971 Studies on the biology of some freshwater fishes. Part *V. Mystus vittatus* (Blotch). *J. Bombay Nat. Hist. Soc.*, 68 (3): 556-572.

Blackburn, M. 1960 A study of condition (weight for length) of Australian Barracouta *Thyrsites atun* (Euphrasen). *Aust. J. Mar. Freshw. Res.*, 11: 14-41.

Chatterji, A. 1974 Studies on the biology of some carps. Ph.D. Thesis, Aligarh Muslim University, Aligarh.

Chatterji, A. 1981 The relative condition factor and length-weight relationship of freshwater carp, *Labeo gonius* (Cyprinidae: Teleostei). *J. Bombay Nat. Hist. Soc.*, 77(3): 436-443.

Chatterji, A., A. Q. Siddiqui and A. A. Khan 1976 The relative condition factor of bata, *Labeo bata* (Ham.) from the river Kali, Uttar Pradesh. Indian. *J. Anim. Res.*, 10(2): 63-68.

Hile, R. 1936 Age and growth of cisco *Leucichthys artedi* (Le Sueur) in the lakes of North Eastern highlands Wisconsin. *U.S. Fish and Wildlife Series Fish Bull.*, 48: 211-316.

Kestevan, G. L. 1947 On the ponderal index or condition factor as employed in fisheries biology. *Ecology*, 28: 78-80.

Khan, H. A. 1972 Studies on the biology of some important major carps. Ph.D. thesis, Aligarh Muslim University, Aligarh.

Khumar, F.1985The biology of *Puntius sarana* (Ham.) and *Labeo calbasu* (Ham.) of some freshwater ecosystem in North India. Ph.D. Thesis, Aligarh Muslim University, Aligarh.

Le Cren, E. D. 1951The length-weight relationship and seasonal cycle in gonad condition and weight in perch, *Perca fluviatalis. J. Anim. Ecol.*, 20: 210-219.

Nisha Shukla 2002 Studies on the Biology of *Labeo gonius* (Hamilton-Buchanan, 1882). Ph.D. awarded by C.S.J.M. University, Kanpur.

Pantulu, V. R.1961 Determination of age and growth of *Mystus guilo* (Ham.) by the use of pectoral spines with observations on its biology and fishery in Hooghly estuary. *Proc. Nat Inst. Sci. India*, 27: 198-225.

Pillay, T. V. R. 1953 Studies on the food and feeding habits and alimentary tract of the grey mullet. *Mugil tade Forskal. Proc. Nat. Inst. Soc. India,* 19: 777-827.

Qasim, S. Z. 1957 The biology of *Blannius pholis* L. (Teleostei). *Proc. Zool. Soc. Lond*, 123: 161-208.

Ramamohan, R. G. 1972 On the biology of *Labeo calbasu* (Ham.-Buch.) from the river Godavari. *Inland Fish. Soc. India*. 4: 74-86.

About the Author :

Dr. Alpana Parmar did her Ph.D in the field of fish and fisheries from DAV College Kanpur University (2010) and joined Department of Zoology M.L.K.(PG) College Balrampur U.P. (accredited Grade "A" by NAAC) as Assistant Professor in 2015. She is engaged in taking classes both at PG and UG level. She has several research papers to her credit in national and international journals of repute and also presented papers in national and international conferences. She is proud recipient of gold medal in MSc (2004) Animal Science Department of M.J.P. Rohilkhand University Bareilly U.P. She has also worked as Project Assistant in Pharmacology Department C.D.R.I. Lucknow U.P. (2006-2007).

FIELD OBSERVATIONS ON THE EARLY FLOWERING OF THE RHODODENDRON (RHODODENDRON ARBOREUM) IN THE GADOLI AND MANDA KHAL FEE SIMPLE ESTATES: AN INDICATOR OF CLIMATE CHANGE IN THE GARHWAL HIMALAYA

Subir Mario Chowfin
C/o The Gadoli and Manda Khal Wildlife Conservation Trust,
P.O. Box 27, Pauri, District Pauri Garhwal, Uttarakhand - 246001
Email: schowfin@yahoo.com
Mobile:+91-8126915911

The Gadoli and Manda Khal Fee Simple Estates are located (30°07′18.1″ N and 78°48′11.4″ E) in the Pauri Administrative Block of the Pauri Garhwal District of the Western Himalayan state of Uttarakhand in India. These Estates consisting of ~450 hectares of private forest are located South East of the town of Pauri and elevation here ranges from about 1200m to 2098m above sea level. These private forests lie within the Western Himalayas of the Himalaya – a transition between the Paleartic and Indo – Malayan Realms. The Himalaya is one of the three biodiversity hotspots in India. Futhermore, as per the Global Ecological Zones identified by the Intergovernmental Panel on Climate Change (IPCC 2006) which are based on observed climate and ecological patterns (FAO 2001) the forests of the Gadoli and Manda Khal Fee Simple Estates may also be classified as falling within the Temperate Mountain Systems. These forests consist of native herbs, shrubs, trees and temperate forest biotopes which include coniferous, broadleaved evergreen, broadleaved deciduous and mixed forest types interspersed with temperate grasslands as per the present IUCN Habitats Classification Scheme with the forests here being dense forest, moderately dense forest and open forest.

The scientific management and working of the forests of these estates was initiated in 1952 -53 through the first working plan for 795 acres which was revised in 1974 by a second working plan for 765 acres. However, in recent times these forests were subject to a large number of illegal non-forest activities

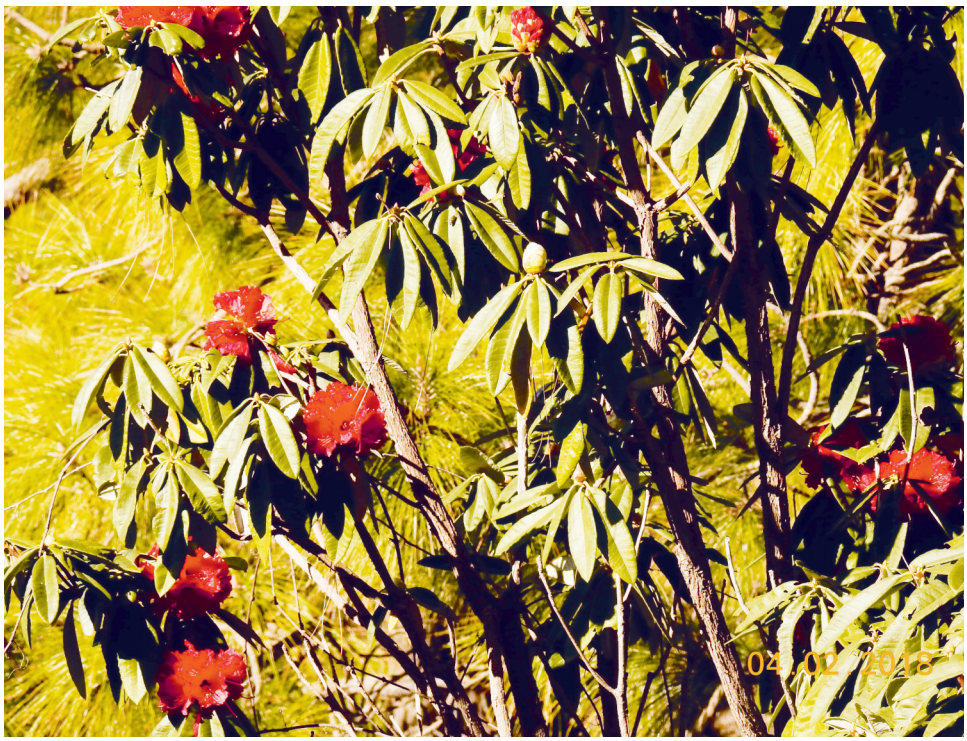
Plate 1: Rhododenron arboreum flowering at Site 1 during April 2017

which included stone quarries, hot – mix plants, dumping of garbage, illegal sale of forest land for commercial development which included agriculture, horticulture and housing. To save these forests from eventual destruction, a Public Interest Litigation (PIL) was filed by me in the National Green Tribunal in New Delhi, India by way of Application No. 19/2012. Following three years of litigation the state government of Uttarakhand finally conceded that 292.177 hectares of the Gadoli Fee Simple Estate and 158.689 hectares of the Manda Khal Fee Simple Estates totalling ~450 hectares are forests leading to a cessation in many of the illegal non-forest activities in these forest areas. Following, the cessation of illegal non – forest activities by the orders of the Hon'ble National Green Tribunal, field surveys on the biodiversity of these private forests are being conducted to inventory vascular plants, birds, reptiles and mammals. During these field surveys Rhododendron (Rhododendron arboreum) flowering at three sites on the Gadoli and Manda Khal Fee Simple Estates was also studied. Site 1 was located at a lower elevation zone of 1500 – 1600m and Sites 2 and 3 were located at higher elevation zone of 1800m –1900m. Rhododendron arboreum flowering was studied at these three sites during 2017 and 2018 and field observations were recorded alongwith photographs of flowering of the species. At Site 1 (30.12258 North 78.80287 East) located within the 1500 – 1600 metre elevation zone, flowering of the species was documented during mid – April 2017, while flowering of the species had not yet started during field surveys in February 2018.

At Site 2 (30.12320 North 78.82403 East) and Site 3 (30.11475 North 78.82883 East) located within the 1800 – 1900 metre elevation zone, flowering was observed during the last week of February in 2017 while in 2018 flowering of the species at these two sites was observed earlier during the first week of February.

Plate 2: *Rhododendron arboreum* flowering at Site 2 in last week of February 2017

Plate 3: *Rhododendron arboreum* flowering at Site 2 in the first week of February 2018



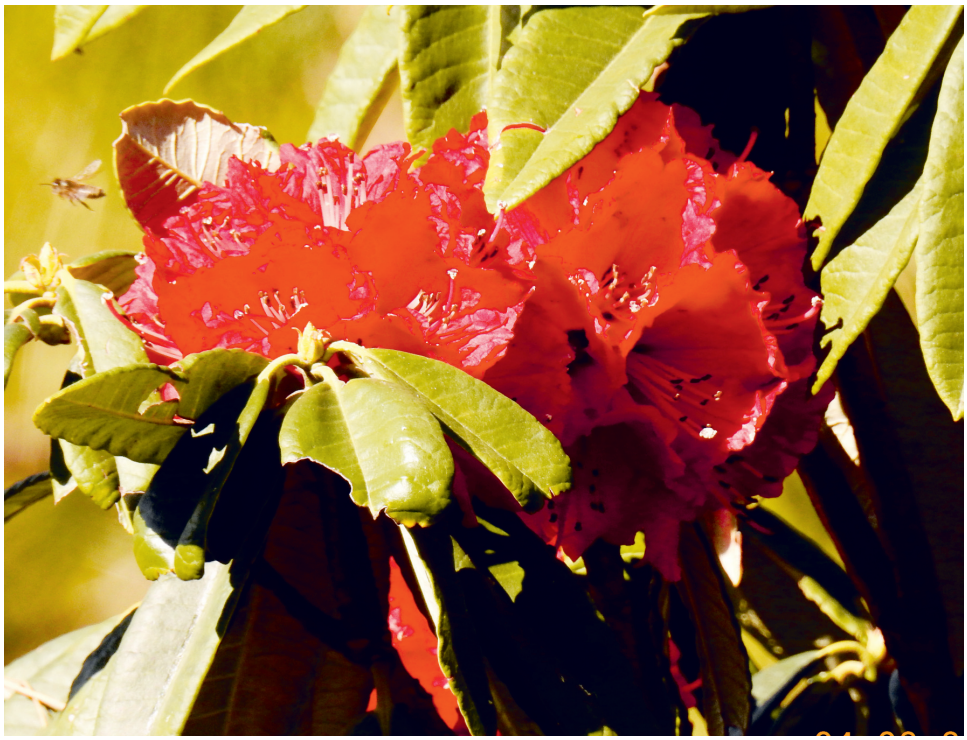


Plate 4: *Rhododendron arboreum* flowering at Site 3 in the first week of February 2018

Iqbal and Negi (2017) document flowering of the species largely during the period from March to May with some instances of late flowering being between June and July while a recent study by Rawal and his colleagues (2018) using GAM, real-time field observations and herbarium records indicate that the species is now flowering during early – February to mid –March, with about 88-97 days earlier flowering over the last 100 years, during which there has been a significant increase in the mean maximum temperature in the past 41 years.

Field observations in the Gadoli and Manda Khal Fee Simple Estates indicate earlier flowering of the species in the 1800 – 1900 metre elevation zone which is collaboration with
the recent study by Rawal and his colleagues. However, there was no change in the flowering period of the species in the 1500–1600 metre elevation zone.

Based on visual observations, the density and canopy cover of the forests is lesser in the higher 1800–1900 metre elevation zone of these estates where Sites 2 and 3 are located while in the lower 1500–1600 metre elevation zone where Site 1 is located, the forests are thicker with tree density being much higher and the canopy cover of the forests here being over 70%. This may explain why Rhododendron arboreum flowering at Site 1 which is in the vicinity of thick oak and conifer forests may still be following natural periods of flowering as the forests surrounding this site may well be regulating local climate by acting as a climate buffer, thereby negating the effects of climate change on the flowering period of the species.

In conclusion, the conservation and preservation of forests rather than the diversion of forests for non-forest purposes should take precedence in the state of Uttarakhand with impetus being given to the management and protection of forests so that they act as climate buffers whether these forests are government, community or privately owned.

Acknowledgement

I would like to thank the Gadoli and Manda Khal Wildlife Conservation Trust for it's immense and valuable support in helping me conduct my field work and ecological studies in the Gadoli and Manda Khal Fee Simple Estates.

About the Author :

Mr Subir Mario Chowfin is from the Pauri Garhwal district in the state of Uttarakhand having done his schooling at St. Joseph's College Nainital and his M.Sc. in Forestry from the Doon (P.G.) College of Agriculture Science and Technology. He is associated with the Gadoli and Manda Khal Wildlife Conservation Trust and has worked in a number of protected areas in India including the Corbett Tiger Reserve and the Pench Tiger Reserves having undertaken research on species like the gharial, the mugger, freshwater turtles, tigers and birds. He is presently undertaking biodiversity and species specific surveys in the Private Forests of the Gadoli and Manda Khal Fee Simple Estates in Pauri Garhwal in Uttarakhand where he is actively involved in forest, wildlife and biodiversity research and conservation. He is a Member of the IUCN SSC Crocodile Specialist Group as well as a qualified Global and Regional Assessor for assessments for the IUCN Red List.

THE WILDLIFE PRESERVATION SOCIETY

PATRONS

Mr Ravi Singh, CEO & Secretary General, WWF-India, New Delhi.
Managing Director, Uttarakhand Forest Development Corporation, Dehradun.
Director General, Uttarakhand Council of Science And Technology, Dehradun.
Mr Ajay Raghav, Narauli, District, Moradabad (UP).
Capt Arjun Balraj Mehta, New Delhi.

EXECUTIVE COMMITTEE

1.	President	Mr Rashmi Kant Shukla, IFS(R)
2.	Executive Vice President	Dr Prashant Singh
3.	Vice President	Mr Vijay Mohan Nath
4.	Secretary	Air Cmde Amul Kapoor VM(R)
5.	Assistant Secretary	Mr Himanshu Joshi
6.	Assistant Secretary	Mr Zaheer Bakshi
7.	Treasurer	Mr Puneet Kaura
8.	Ex. Officio VP, Eastern Zone	CWLW, Nagaland
9.	Ex. Officio VP, Southern Zone	CWLW, Tamil Nadu
10.	Ex. Officio VP, Western Zone	CWLW, Rajasthan
11.	Ex. Officio VP, Northern Zone	CWLW, Uttar Pradesh
12.	Lady Member	Mrs Rohini Puri
13.	Lady Member	Dr Sangeet Khare
14.	Member	Mr Mansoor Mazhar
15.	Member	Mr RD Singh Chandella
16.	Member	Mr Maxim Thomas
17.	Member	Mr Pankaj Tomar
18.	Member	Mr Raghvendra Singh
19.	Member	Mr Atendra Singh
20.	Member	Capt Rakshit Sharma
21.	Ex. Officio Member	Director, Wildlife Institute of India, Dehradun
22.	Ex. Officio Member	Addl DG, Wildlife MOEF Govt of India
23.	Ex. Officio Member	PCCF, Uttarakhand
24.	Ex. Officio Member	Chief Wildlife Warden, Uttarakhand
25.	Ex. Officio Member	Distt Magistrate, Dehradun
26.	Ex. Officio Member	SSP, Dehradun

EDITORIAL BOARD

1. Dr DS Gaur 2. Dr Prashant Singh 3. Dr SP Singh
4. Mrs Rohini Puri 5. Mr SS Khaira

EDITED AND PUBLISHED BY

Editorial Board, The Wildlife Preservation Society
Heritage Apartments, Flat No. 2, First Floor,
18 New Road, Dehradun, Uttarakhand (248 001)
email : wpsidoon@gmail.com,
Tel : 0135-2652410

MEMBERSHIP FORM

THE WILDLIFE PRESERVATION SOCIETY

(Established 1958)

Heritage Apartments, Flat No. 2, First Floor,
18 New Road, Dehradun, Uttarakhand (248001)
Tel : 0135-2652410
email : wpsidoon@gmail.com

I hereby apply to be admitted as a Life/Annual/Affiliated/Institutional/Student Member of the Wildlife Preservation Society.

My details are given below: -

Name ……

Address ……

……

Phone No. with STD Code ……

Mobile No. ……

WhatsApp No. ……

Email ……

Date of Birth ……

Marital Status ☐ Married / ☐ Single

Hobbies and Interests ……

……

……

Any conservation work done ……

……

……

……

I am attaching the copy of Aadhar card herewith.

PLEDGE

I hereby affirm and assure that I shall abide by the rules and regulations and constitution of WPS. I shall not do anything contrary to the ethics of wildlife conservation and do whatever possible at my end, to uphold the dignity of the Society and discharge my duty to save and conserve wildlife and its habitat. I declare that there is no criminal case against me.

Date : ..... Applicant's Signature

Recommended by (Preferably Life member of WPS)

1. ……

2. ……

Approval by the Members of Screening Committee (Minimum three) and comments:

1. *Name* ……

   Comments ……

   …… *Signature*

2. *Name* ……

   Comments ……

   …… *Signature*

3. *Name* ……

   Comments ……

   …… *Signature*

4. *Name* ……

   Comments ……

   …… *Signature*

5. *Name* ……

   Comments ……

   …… *Signature*

THE WILDLIFE PRESERVATION SOCIETY

1. The aims and objects of the Society are as follows:-

   a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.

   b) To cooperate with the Govt. of India and State Governments and with others Societies and institutions having similar aims and objects in working for the interests of wildlife.

   c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.

   d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so to conserve and increase wildlife stocks.

   e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.

   f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.

   g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.

   h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.

   i) To carry on such other activities which will serve the above subjects?

2. What membership of The Wildlife Preservation Society will entitle you to ?

   a) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.

   b) You will be entitled to the full use of the library of the Wildlife Preservation Society and it's reading room.

   c) You will receive a Membership Certificate.

d) You will receive a personal Identification and Membership Card.

e) You will be entitled to buy all publication of the Society at a concessional rate.

f) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. The label badges and the Balance of Nature Game (specially Publication in colour for its educative and recreational values).

g) You will be supplied "Cheetal", the quarterly journal of the society free.

3 For membership particulars write to

Honorary Secretary,
The Wildlife Preservation Society,
Heritage Apartments,
Flat No. 2, First Floor,
18-New Road, Dehradun
Uttarakhand-248001.

MEMBERSHIP FEES

1.	Patrons Fee	`. 1,50,000
2.	Life Member Fee (Individual)	`. 10,000
3.	Annual Member Fee (Individual)	`. 5,000
4.	Institutional Member Fee (Annual)	`. 10,000
5.	Institutional Member Fee (Life)	`. 25,000
6.	Student Member Fee (Annual)	`. 500

METHODOLOGY FOR WRITE UP & SUBMISSION OF PAPERS

- PAPER TITLE
- Author Name (s)
- Author Affiliation(s)
- E—mail

Abstract

The abstract is to be in fully - justified italicized text as it is here, below the author information. Use the word "Abstract" as the title, in 12 - point Times New Roman, bold- face type, centered relative to the column, initially capitalized. The abstract is to be in 11- point, single-spaced type, and may be up to 3 in. (18 picas or 7.62 cm) long. Leave two blank lines after the abstract, and then begin the main text. All manuscripts must be in English.

Keywords: We would like to encourage you to list your keywords in this section

1. Introduction

Please follow the steps outlined below when submitting your final draft to the Editorial Board, WPS. These guidelines include complete descriptions of the fonts, spacing, and related information for producing your proceedings manuscripts. Please follow them and if you have any questions, direct them to the production editor in charge of your journal at the WPS.

2. Formatting your Paper

All text, illustrations, and charts, must be kept within the parameters of an A4 sized sheet. Margins are one inch on all sides. Paper orientation in all pages should be in portrait style.

3. Main Title

The main title (on the first page) should begin 1 3/16 inches (7 picas) from the top edge of the page, centered, and in Arial Font - 12 point, capital boldface type (e.g.. PRESERVATION OF NATURE). 4- Author Name (s) and Affiliation (s)

Author names and affiliations are to be centered beneath the title and printed in Arial 12-point non-boldface type. (See example below)

3.1. Affiliations

Affiliations are centered, italicized, not bold. Include e-mail addresses if possible.
For example:

Author[1], Author[2] and Author[3]
[1]*Affiliation*

Appendix

An appendix, if needed, should appear before the acknowledgments.

Acknowledgments

These should be brief and placed at the end of the text before the references.

References :

List and number all bibliographical references that has important contribution on the paper, (if possible, limit to 30; only necessary citations are recommended). 9-point Arial, fully justified, single-spaced, at the end of your paper. When referenced in the text, enclose the citation number in square brackets, for example [1]. Do not abbreviate the months. Do not forget to put period (.) at the end of each reference. **(See examples below)**

Journal Article

Book

Chapter in a Book

Conference Proceedings

Patent

Do not use the phrases **"et al."** and **"ibid."** in the reference section. Instead, the names of all authors in a reference must be listed.

Copyright Forms

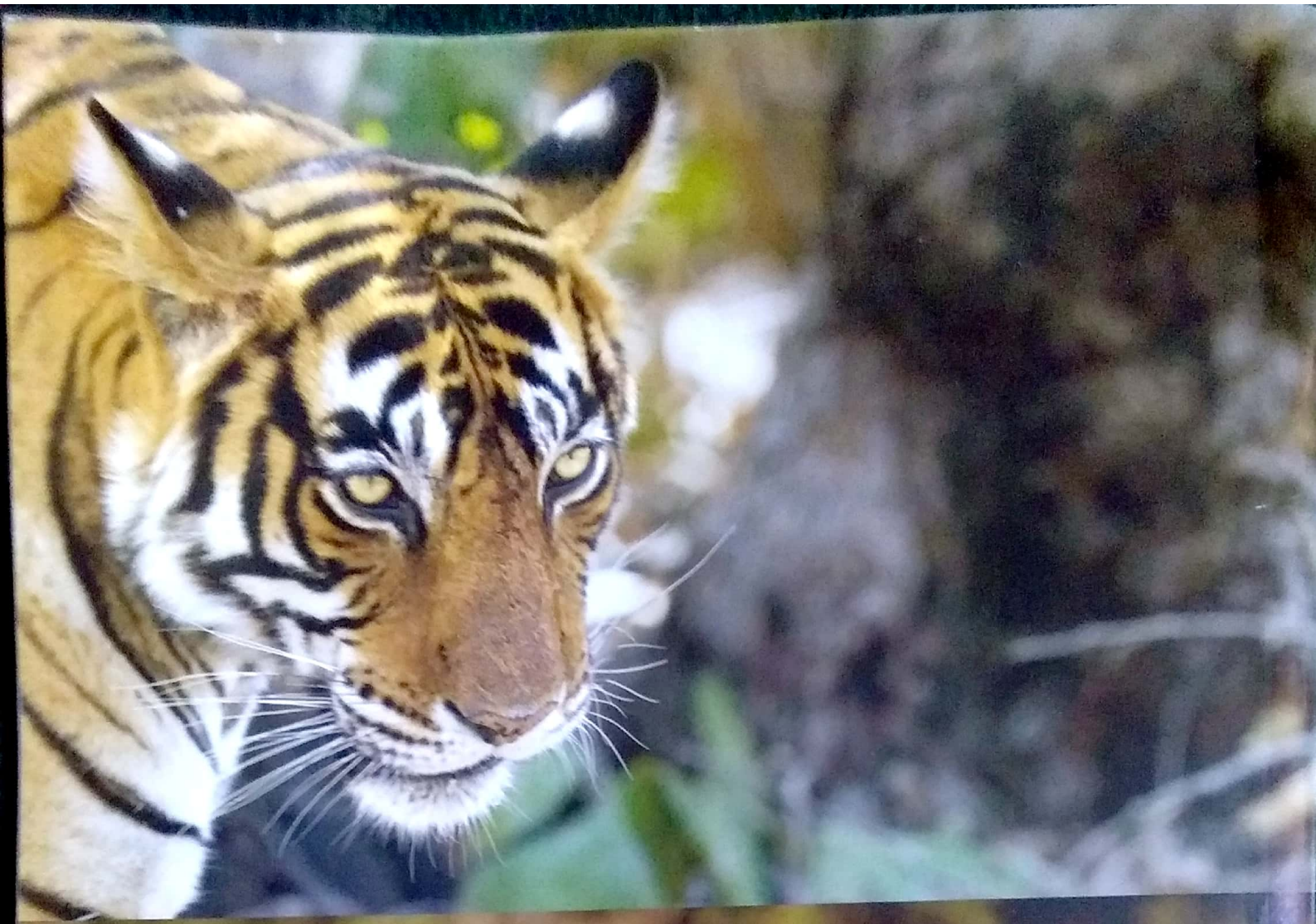
You must include your fully-completed, signed WPS copyright release form when you submit your paper. WE MUST HAVE THIS FORM BEFORE YOUR PAPER CAN BE PUBLISHED IN THE JOURNAL. The copyright form would soon be available on our website. **Authors ARE REQUESTED** to email their papers and copyright forms to electronically to **wps_editorialboard@yahoo.com**

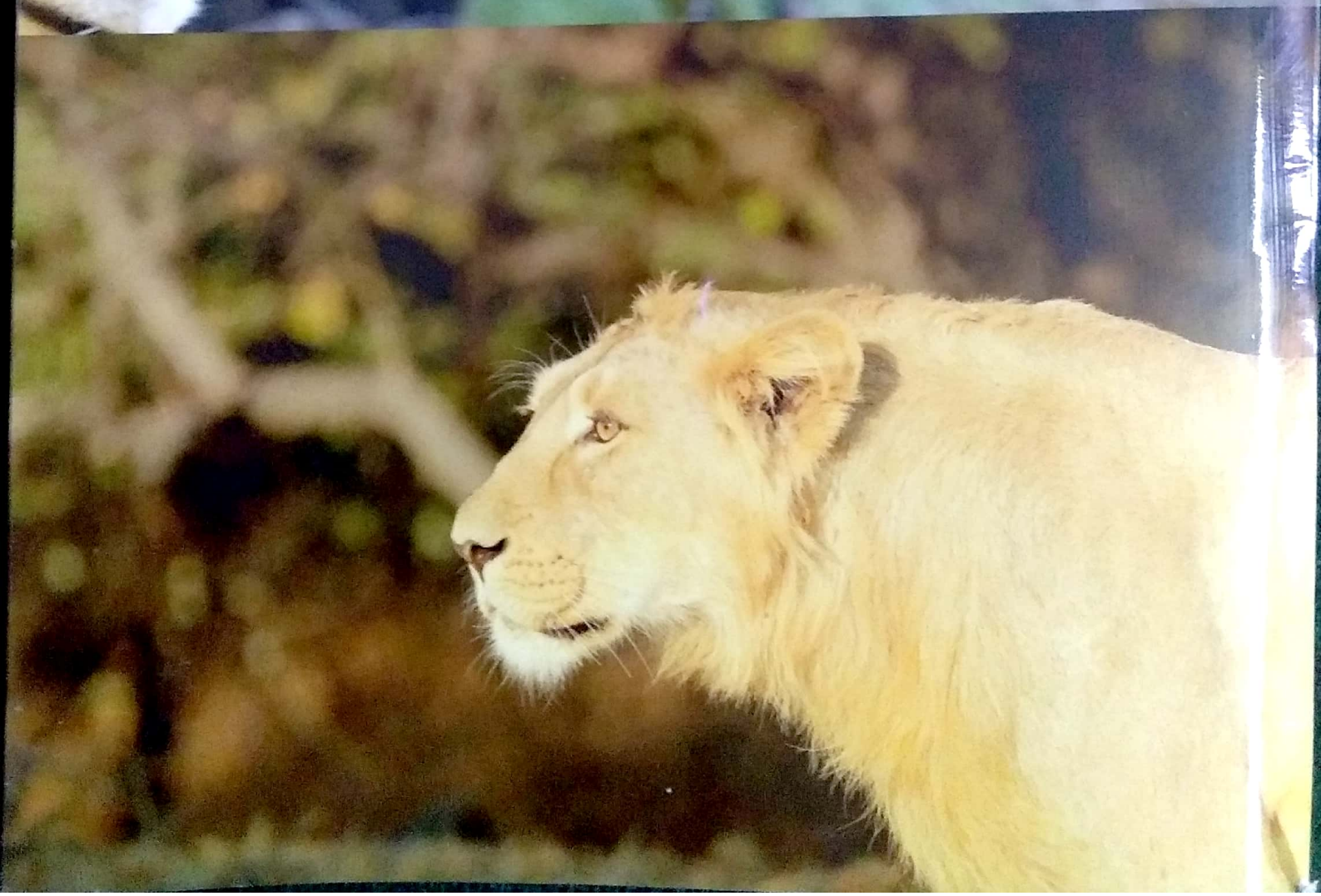
A WRITE UP ON THE AUTHORS

Name:

Write Up:

Scanned by CamScanner





Scanned by CamScanner